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Executive Equity Incentives, Earnings Management and Corporate Governance

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Executive Equity Incentives, Earnings Management and Corporate Governance

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Dedication

To Joseph, for your unselfish support and unwavering encouragement.

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Executive Equity Incentives, Earnings Management and Corporate Governance

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This paper investigates whether executive wealth sensitivity to stock price fluctuations or executive equity transactions serve as incentives for earnings management. I find that increasing wealth sensitivity, most notably the sensitivity arising from stock holdings, is associated with CEO abnormal accrual usage. Further, the relation between abnormal accruals and stock-based wealth sensitivity is consistent with income-smoothing earnings management. Since smooth earnings are associated with higher stock valuations my findings suggest that wealth exposure arising from stock ownership is effective in aligning the interests of CEOs and shareholders.

I also analyze whether governance quality influences the wealth sensitivity-abnormal accrual relation. While strong governance is associated with lower overall levels of abnormal accruals, governance does not significantly influence the association between CEO stock-based wealth sensitivity and earnings smoothing. The failure of

governance to curb earnings management supports the proposition that income smoothing is an expected outcome of efficient contracting consistent with incentive alignment.

I also examine whether executives opportunistically manage earnings in order to maximize the value of their stock transactions. My findings suggest managers behave opportunistically. Specifically, I find an increase in income-decreasing accruals preceding large stock purchases by CEOs as well as an increase in income-increasing accruals following, but not preceding, large stock sales by CEOs; both suggest trading on private information. I also document that governance does not materially affect CEO use of abnormal accruals around transactions.

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Chapter 1: Introduction

This dissertation provides evidence on the relations between executive stock-based compensation and earnings management, and whether these relations are influenced by corporate governance structure. In particular, I examine the association of abnormal accruals with (1) executive wealth sensitivity to changes in stock price and (2) executive stock transactions. I define wealth sensitivity as the change in the value of the executive's equity holdings given a one percent change in stock price. I find that chief executive officer (CEO) wealth sensitivity arising from stock holdings is associated with abnormal accruals, the association is consistent with income-smoothing, and variations in corporate governance do not appear to influence the association. I also find an association between CEO wealth sensitivity related to unvested stock options and abnormal accruals that is consistent with income-increasing earnings management. Further, this tendency to use income-increasing earnings management appears to decrease in governance quality.

I also find evidence that CEOs use accruals to manipulate earnings around large stock transactions. Specifically, income-decreasing accruals precede large stock purchases and income-increasing accruals follow large stock sales. I find no evidence of accrual manipulations prior to CEO stock sales or option awards. When the tests are repeated for chief financial officers (CFOs) there is no indication of stock-related earnings management, except for use of income-decreasing accruals prior to option grants.

Use of equity-based compensation has undergone dramatic growth through the 1990s. Concurrent with this growth there has been increasing concern about the cost and effectiveness of equity compensation, as well as its potential to motivate earnings

management. Regulators, shareholder advocacy groups and the financial press have suggested that stock-based compensation provides incentives for managers to manipulate accounting results for personal gain. For example, the Ninth Annual CEO Compensation Survey (2002), co-sponsored by the Institute for Policy Studies and United for a Fair Economy concludes "the current approach to compensation encourages excessive risk-taking and the wide-spread adoption of aggressive accounting techniques that blur the truth and overstate earnings but boost CEO pay." Similar concerns are expressed by Norman Johnson, former Securities Exchange Commission (SEC) commissioner, in his 1999 speech: "Companies may attempt to manage earnings for numerous reasons … the single most important is the pressure … to meet analysts' expectations...This factor, combined with recent increased emphasis on stock options as a key component of executive compensation …have both operated to increase the temptation for management to fudge the numbers."

On the other hand, equity compensation is designed to align executive and shareholder incentives by giving the executive an ownership stake in the firm (Jensen and Meckling 1976). Advocates for equity-based pay contend that equity incentives are essential components of compensation that, when coupled with adequate governance controls, are effective in aligning the manager's incentives with those of shareholders with minimal risk of adverse consequences. This position is supported by the governance literature which documents that the two most important functions of a corporate board of directors are designing compensation contracts for and monitoring of executive management (Hermalin and Weisbach 2003).

Given these opposing viewpoints, I investigate three sets of research questions. First, I examine whether CEO and CFO wealth sensitivities to stock price are associated with income-increasing and/or income-smoothing earnings management. I conduct cross-

sectional regressions to investigate the relation between abnormal accruals and executive wealth sensitivity to stock price variations. I find that CEO, but not CFO, wealth sensitivity is positively associated with the magnitudes of both positive and negative abnormal accruals suggesting that wealth sensitivity is related to earnings management. I then repeat my regressions after decomposing wealth sensitivity into three components – stock-based wealth sensitivity, vested option-based wealth sensitivity and unvested option-based wealth sensitivity – in order to determine whether the relations differ across holding types. I find the magnitudes of both positive and negative abnormal accruals increase directly with stock-based wealth sensitivity, the magnitudes of positive abnormal accruals increase with unvested option-based wealth sensitivity, and no significant association between abnormal accruals and vested option-based wealth sensitivity.

Next, I examine whether governance strength influences the relation between CEO wealth sensitivity and abnormal accruals. My proxy for governance strength is a synthesis of measures of board make-up, ownership structure and institutional environment which have been shown to influence use of abnormal accruals (Klein 2002; Koh 2003; Leuz, Nanda and Wysocki 2003; Xie, Davidson and DaDalt 2003). In order to examine whether governance affects the association between abnormal accruals and wealth sensitivity, I expand my regressions to include sensitivity-governance interaction terms. Governance does not appear to influence the relation between stock-based wealth sensitivity and abnormal accruals but does seem to attenuate the relation between unvested option-based wealth sensitivity and positive abnormal accruals.

To test whether the observed relation between stock-based wealth sensitivity and abnormal accruals is evidence of income-smoothing I investigate whether, conditional on large abnormal accrual magnitudes, higher sensitivity is associated with smoother

earnings. My results reveal the abnormal accrual usage is consistent with income-smoothing.

The second set of research questions examines whether CEOs and CFOs use income-increasing accruals prior to or following stock sales, and whether the tendency to inflate earnings is mitigated by governance. Earnings management may be used pre-sale to attempt to bolster stock price or prevent the value-decreasing effect of a negative earnings surprise. Earnings management may be used post-sale to delay earnings declines that would arouse suspicion that the trade was based on material inside information.

I conduct an event study to examine positive abnormal accrual usage preceding and following insider sales. My tests reveal no evidence of income-increasing accruals preceding CEO and CFO sales. Thus, these insiders do not appear to manage earnings upwards in order to sell their shares at inflated prices. The CEOs do, however, appear to use positive accruals following large and medium sized stock sales suggesting they use accounting discretion to distance significant stock sales from the revelation of bad news. Furthermore, governance quality does not appear to deter the accrual usage.

My final research questions investigate whether insiders manipulate accruals preceding stock purchases and option grants and whether governance influences accrual use. Managers may behave opportunistically by taking actions to depress stock prices or avoid value increasing surprises prior to option incentive awards and open market stock purchases. Applying the same event study methodology used for insider sales, I find that abnormal accruals preceding large CEO stock purchases are significantly lower than control abnormal accruals consistent with CEOs opportunistically managing earnings in order to purchase shares at a discount. CEOs do not appear to take income-decreasing actions prior to option grants.

I find little evidence that CFOs manage earnings around their transactions except for the period immediately preceding option grants. The observed option grant–abnormal accrual relation for the CFOs is negative, consistent with pre-grant earnings management. Governance does not materially affect use of pre-grant or pre-purchase abnormal accruals.

In total my findings indicate that: abnormal accrual patterns consistent with income-smoothing earnings management are associated with the sensitivity of the CEO's stock-based wealth to the firm's stock price; income-increasing earnings management is associated with the sensitivity of CEO wealth to fluctuations in the value of unvested options; CEOs sell shares in expectation of poor earnings performance and use income-increasing earnings management to distance their transactions from the disappointing news; CEOs use income-decreasing earnings management preceding large equity purchases; income-decreasing accruals precede CFO option grants; and corporate governance does not seem to influence any of these relations except the association between unvested option-based wealth sensitivity and abnormal accruals which decreases in governance strength.

This study contributes to both the earnings management and corporate governance literatures. My results suggest that CEO wealth sensitivity and CEO stock transactions provide incentives to manage earnings. These findings have implications for compensation design. Executive exposure to firm specific risk may have unintended consequences that are not mitigated by more effective monitoring. On the other hand, the ability to empirically document compensation related earnings management suggests that, consistent with a number of analytic models, it may be part of an equilibrium compensation structure (see Arya, Glover and Sunder 1998 for a summary). The failure

of governance to significantly impact most of the observed earnings management further supports this possibility.

These results also have potential policy implications. In the wake of the accounting scandals of the last several years, regulators have tightened standards for corporate governance. My findings suggest that reliance on such standards as deterrents to compensation-related earnings management may not be warranted.

The remainder of the dissertation is organized as follows: Chapter 2 summarizes prior research relevant to my questions. Motivation for the questions and hypothesis development are included in Chapter 3. Chapter 4 presents the empirical investigation of the association between executive wealth sensitivity and abnormal accruals and the influence of governance on the association. Chapter 5 examines the relations among insider trading, earnings management and governance. I discuss my findings and conclude my study in Chapter 6.

Chapter 2: Literature Review

This study draws and builds on three major streams of accounting and finance research – compensation and governance, insider trading, and earnings management. This chapter provides a review of the studies that form the basis for my hypotheses as well as those studies that provide related evidence.

2.1 COMPENSATION CONTRACTING

The literature on compensation contracting is extensive. I selectively survey the studies related to issues that are particularly relevant to my research design. First, I briefly explore the role of equity in compensation contracting. Next, I review recent trends in executive compensation. Finally, I examine alternative approaches to measuring the incentive effects arising from managerial ownership.

2.1.1 Use of Equity in Compensation Contracting

Firms may elect to use equity awards to compensate executives because of cash constraints, in order to minimize reported compensation expense or due to tax considerations. Both stock awards and option grants provide a means of rewarding employees without a cash outlay. Ittner, Lambert and Larcker 2001 document that cash-constrained technology firms rely on equity compensation more than manufacturing firms. Bryan, Hwang and Lillian (2000) also find cash constraints are important determinants of option compensation.

In addition, options are accorded favorable accounting and tax treatments. The value of option grants is not recognized as compensation expense under U.S. Generally Accepted Accounting Principles (GAAP), and equity awards tied to performance hurdles are exempt from the $1 million tax deductibility limit on compensation. Dechow, Hutton and Sloan (1996) and Core and Guay (1999) find evidence that option use is greater for

firms that face greater costs of reporting low earnings. Bryan, Hwang and Lillian (2000) document that tax status also influences compensation practices.

However, most firms view equity awards as a low cost mechanism to help managers achieve a desired level of ownership (Core and Guay 1999). Agency theory predicts that managerial ownership mitigates moral hazard by aligning managerial and shareholder interests. A substantial body of theoretic research holds that tying managerial compensation to firm performance reduces the agency problems that arise from the separation of corporate ownership and control (e.g. Jensen and Meckling 1976; Homstrom 1979).

While there is no model of equilibrium ownership, scholars agree that optimal ownership is endogenously determined based on firm, contracting and industry characteristics in a manner intended to minimize agency costs. Empirical evidence suggests that target levels of managerial ownership exist in practice. Firms grant more equity compensation to executives with low equity incentives (Core and Guay 1999), and these executives do not have offsetting stock sales in the years they receive new awards (Ofek and Yermack 2000). However, Ofek and Yermack (2000) also find that once managers achieve a certain ownership level they actively rebalance their portfolios when they receive new equity awards.

2.1.2 Trends in Executive Compensation Contracting

Most executive pay packages include three major elements: a fixed salary, a performance-based bonus and equity-based pay, usually given in the form of restricted stock or as option grants. Salary is independent of firm outcomes, but bonus is often tied to accounting-based performance measures. The value of equity-based pay depends on stock performance. For this reason, Jensen and Murphy (1990) specifically advocate equity-based compensation as a means of providing incentives for managers to maximize

firm value. Furthermore, equity-based pay encourages stock ownership which creates a direct link between manager and shareholder welfare by providing managerial incentives to increase stock price.

Despite the apparent importance of executive ownership, Jensen and Murphy (1990) concluded the equity holdings of the average CEO did not appear to generate sufficient incentives to overcome self-interested perquisite consumption. Their findings and conclusions formed the basis for a shift in executive compensation practices which increased emphasis on equity-based pay. In 1980, CEOs received an average $155,000 in option grants and $655,000 in salary and bonus pay (Hall and Liebman 1998). By 1994, the average annual option award of $1.2 million nearly equaled average total cash compensation of $1.3 million. By 1998, median stock and option holdings of Standard & Poor's (S & P) industrials CEOs stood at $30 million and $55 million (Hall and Murphy 2002) confirming that the intensive use of equity awards, coupled with a bull market, succeeded in increasing managerial ownership. Furthermore, equity incentives are now the primary drivers of CEO wealth formation. Hall and Liebman (1998) find that the changes in CEO wealth from stock and option revaluations are over fifty times the wealth increases from salary and bonus changes.

2.1.3 Measurement of Equity Incentives

Despite the importance of equity incentives in executive contracting, there is a great deal of uncertainty about how to measure incentives and how firms determine optimal incentive levels. In particular, there is considerable debate over the correct basis to use in assessing incentive levels, and at a more fundamental level, how to value executive equity holdings.

Financial economists have traditionally viewed executive incentives in terms of pay-performance sensitivity where pay is change in executive wealth and performance is

change in firm value. Under this definition incentives are directly determined by the percentage of the firm owned by the executive. This concept of incentives is based on Jensen and Meckling (1976), who suggest an agency problem exists whenever an executive owns less than 100% of the firm because managers with lower levels of ownership have an incentive to consume perquisites since the manager enjoys the full benefit of the perquisite but only bears his fractional share of the cost. Based on this "share of the firm owned" concept of pay-performance sensitivity, Jensen and Murphy (1990) find the median wealth of a CEO rises by $3.25 when the value of the corporation increases by $1000 for a sample consisting of CEOs listed in the Forbes Executive Compensation Surveys. They conclude that CEO equity incentives are too weak to be economically meaningful.

Another regularity observed using this definition of incentives is that the incentives of CEOs of large firms are usually insignificant relative to those for CEOs of small firms. To illustrate, consider two CEOs – one who owns 0.1% of a firm with a market value of $1 billion while the other holds 20% of the stock of a $5 million firm. Both CEOs hold equity valued at $1 million, but the small firm's CEO has incentives that are two hundred times stronger than those of the large firm's CEO. This result is troubling since theory and common sense both suggest that large firm CEOs should require greater incentives than their small firm counterparts.[1]

These apparent contradictions have led a growing number of researchers to advocate use of a more holistic, manager-centered perspective for measuring incentives. This approach considers the importance of equity valuation shifts relative to the executive's total wealth. For example, the $85 million median level of equity holdings

[1] For example, Demsetz and Len (1985) argue that it is more difficult to monitor managers of large firms which leads to greater moral hazard; Smith and Watts (1992) suggest that large firms require more talented managers who must be highly compensated.

documented by Hall and Liebman (1998) for large firm (i.e. S & P 500) CEOs leads them to conclude that high levels of personal wealth exposure provide powerful incentives for risk averse, wealth-constrained CEOs even though their percentage holdings may be small.

Baker and Hall (2004) reconcile these conflicting views with a model that demonstrates how the manner in which CEO actions affect firm value determines the appropriate basis for evaluating incentive effects. If a CEO action primarily affects dollar returns, as is typically the case for perquisite consumption, then the traditional share of the firm owned approach is appropriate. However, when actions (e.g. strategic actions) affect firm percentage returns, incentives arise from the effects of a change in stock price on the value of the executive's holdings so the manager-centered perspective applies. The latter case holds when the percentage impact of the CEO action remains fairly constant across firms of varying sizes suggesting the agency problem faced by large firms is similar to that of smaller firms for these types of activities. Core, Guay and Larcker (2003) point out that this is likely to be true in the majority of situations.

Regardless of which measure is appropriate, implementing either requires equity instruments be valued from the executive's perspective. While most researchers use market value for share holdings and Black Scholes value for option holdings, it is widely acknowledged that executive options violate several major assumptions underlying the Black Scholes model. First, the options are non-transferable so market price may not be the appropriate measure of value. Second, Black Scholes assumes a risk-neutral investor, which is not descriptive of the typical executive whose wealth is concentrated in the firm. As a consequence, incentives estimated using Black Scholes values do not adjust for the additional risk imposed on undiversified executives. In order to accurately adjust for risk, a researcher must know the form of the executive's utility function and the nature and

amount of the executive's non-firm assets – neither of which is generally available. However, Baker and Hall (2004) conclude that variation in CEOs' marginal utilities of income arising from non-firm wealth is not likely to be significant when compared to variations in wealth resulting from their firm holdings.

The importance of risk-adjusting estimated option values is also debatable. Core and Guay (2003) argue that, assuming an executive can rebalance his portfolio within a reasonably short amount of time, risk imposition on undiversified executives should not affect their valuation of their new grants or of the wealth effects from their existing holdings. The logic underlying their argument is summarized as follows. On average, incentive contracting is optimal. If an executive holds a lower value of firm stock than has been contracted upon, new awards will be retained to meet the requirements of his ex ante agreement. These awards will not be discounted since they do not alter the amount of risk the executive has contracted for. Equity awards made when an executive has achieved optimal risk-sharing are given as a substitute for cash compensation due to tax, accounting or liquidity considerations. Firms expect executives to rebalance their portfolios when they receive awards made in lieu of cash compensation. Since the executive sheds the risk through rebalancing no additional risk is borne and he does not discount the value of the grant. Similarly, since portfolio revaluations do not alter the agreed upon level of equity holdings, the revaluation may be used to either meet contractual requirements, or the additional value may be divested. Again, there is no reason for the executive to discount the incentives arising from his portfolio revaluation.

2.2 EARNINGS MANAGEMENT

This section gives a survey of relevant earnings management literature. First I briefly explore two earnings management strategies - directional earnings management, where the objective is to shift the mean value of reported earnings, and income-

smoothing earnings management, where the objective is to reduce the time series variance of reported earnings. Next, I provide an overview of the research on capital markets earnings management incentives.

2.2.1 Directional Earnings Management

Most earnings management studies assume directional income manipulation; they examine specific settings where there are incentives to increase or decrease earnings employing unidirectional tests. Often, these studies are structured as event studies where the incentive is the event; other studies use a cross-sectional design where the incentive is a sample characteristic. Examples of the former include capital market studies where the event is meeting or beating analyst forecasts (Degeorge, Patel and Zeckhauser 1999), and studies of earnings management related to debt contracting where the event is a potential covenant violation (DeFond and Jiambalvo 1994). Event-type studies, by virtue of their research design, do not examine whether the observed evidence of earnings management is part of a smoothing strategy.

On the other hand, cross-sectional studies implicitly assume that the characteristic motivating the earnings management elicits repeated use of unidirectional earnings management. Studies using a cross-sectional approach examine whether income-increasing earnings management increases in firm characteristics such as board independence (Beasley 1996; Klein 2002; Peasnell, Pope and Young 2000; Xie, Davidson and DaDalt 2003), or management characteristics such as level of stock-based wealth compensation (Cheng and Warfield 2003; Erickson, Hanlon and Maydew 2003). If abnormal accruals are the measure of earnings management, the test design looks for abnormal accruals that are on average more positive (or more negative) for high levels of the motivating characteristic than for low levels of the characteristic.

In total, evidence of directional earnings management is abundant. Income-increasing and/or income–decreasing earnings management is associated with bonus compensation, debt contracts, regulatory and capital markets benchmarks, and issuance of equity.

Furthermore, earnings management appears to successfully influence beliefs about a firms' economic performance despite the transparency of the incentives. For example, Sloan (1996) and Collins and Hribar (2000) find the market overestimates the persistence of accruals. Sloan shows that firms with high current accruals experience declines in both earnings and price over the next three years. Collins and Hribar document that the mis-pricing of accruals is economically meaningful.

2.2.2 Income-Smoothing Earnings Management

Earnings smoothing involves inter-temporal shifting of reported earnings in order to make earnings appear less variable over time. Smoothing has been the subject of accounting research for the past 40 years. Unlike the directional earnings management literature the smoothing literature is more exploratory, aimed primarily at documenting the existence of smoothing rather than understanding the motivation for smoothing. While a number of theoretical papers model smoothing motives, few empirical studies attempt to test the theories. One exception is DeFond and Park (1997) who test implications of the Fudenberg and Tirole (1995) model that suggests managers' job security concerns motivate them to smooth earnings. They find that when current earnings are low (high) and expected future earnings are high (low) managers borrow earnings from (reserve earnings for) the future, which they assert is consistent with the job security model.

In another recent study, Subramanyam (1996) conducts an extensive series of tests to identify the extent to which smoothing is used in practice. He finds evidence of

pervasive income smoothing and documents that smoothing improves the predictability and persistence of reported earnings.

The motive for smoothing is clear – firms with smooth earnings command a market premium over those with variable earnings. Allayanis and Weston (2003) find that a one standard deviation increase in earnings volatility is associated with a 6 to 21 percent decrease in firm value. Thomas and Zhang (2002) confirm that higher price earnings (P/E) ratios are associated with lower earnings volatility and this P/E effect is due to lower risk and higher forecasted growth.

2.2.3 Earnings Management Incentives

Existing research usually attempts to document earnings management by examining situations where incentives to manage earnings are high. Most rely on either abnormal accrual levels or patterns of reported earnings around certain benchmarks as measures or indicators of earnings manipulation. Earnings management motives fall into two general categories – contracting-based motives and capital markets motives. This dissertation builds on the capital markets literature, so I limit my review to this area.

A substantial body of recent research documents that capital market concerns appear to motivate earnings management. One stream of research examines specific capital market activities such as initial public offerings (IPOs) and seasoned equity offerings (SEOs) which provide a setting where managers may use earnings management to attempt to increase the proceeds from the stock sales. These studies are motivated by observations that IPO and SEO firms under-perform the market in the years following their offerings.

Teoh, Wong and Rao (1998) find IPO firms have high positive issue-year abnormal accruals and that these accruals explain the variation in post-issue earnings and stock returns. The findings related to SEOs are similar. Rangan (1998) and Teoh, Welch

and Wong (1998) document that abnormally high earnings reported at the time of SEOs are attributable to accruals, post-SEO earnings are unusually poor and the post-SEO stock performance is inversely related to the extent of pre-SEO earnings management. Taken as a whole, the results of these studies suggest that equity issuance provides a strong incentive to manage earnings, and the extent of the earnings management and the incentives to overstate income prior to equity issuance are not fully appreciated by investors.

A second stream of capital markets earnings management research relies on distributional regularities of earnings to infer earnings management. The seminal work in this area is Burgstahler and Dichev (1997, BD). BD examines distributions of reported earnings around two earnings benchmarks – zero earnings, and prior period earnings. Their findings are consistent with the hypotheses that managers have incentives to avoid reporting losses and earnings declines. Subsequent studies using BD's methodology show that accounting discretion is used to sustain earnings growth strings (Beatty, Ke and Petroni 2002) and to meet or exceed analysts' forecasts (Burgstahler and Eames 2002).

Since missing a benchmark has a significant negative effect on valuation (Bartov, Givoly and Hayn 2000; Skinner and Sloan 2000), and since firms that maintain consistent growth strings command a market premium (Barth, Elliott and Finn 1999), such earnings management appears to be economically motivated.

2.3 EQUITY-BASED COMPENSATION CONTRACTING, CORPORATE GOVERNANCE AND EARNINGS MANAGEMENT

This final section of the literature review focuses on research that is closely related to my study. Only recently have researchers started to explore whether equity-based compensation contracting may provide incentives to manage earnings. Evidence amassed to date suggests it does.

2.3.1 Earnings Management Associated with Compensation Mix and Ownership

Three recent papers provide evidence related to stock-based compensation and earnings management. Gao and Shrieves (2002, GS) examine the relation between various compensation components and earnings management. They find that bonuses, option grants and the incentive intensity of option grants are directly related to magnitudes of discretionary current accruals. They do not test for equity related wealth sensitivity, nor do they control for equity holdings in their regressions.

In a related study, Cheng and Warfield (2003, CW) also document a relation between equity compensation elements and earnings management. They find the probability of earnings meeting or just beating analyst forecasts increases in stock-based compensation, and that income-increasing abnormal accruals are positively associated with stock-based compensation and future stock sales.

One previous study, Erickson, Hanlon and Maydew (2003, EHM), explicitly examines executive wealth sensitivity to stock price for a sample limited to 46 firms accused of accounting fraud by the Securities and Exchange Commission (SEC). For this unique sample, they find the probability of fraud is increasing in the percent of compensation that is stock-based but the relation between their estimate of executive sensitivity and fraud is not significant.

2.3.2 Earnings Management Surrounding Insider Transactions

Evidence of possible management of earnings and/or disclosures prior to insider equity sales is found in several studies (Summers and Sweeney 1998, Beneish 1999; Beneish and Vargus 2001, Noe 2000). In addition, insider sales are found to be more predictive of long-term performance than short-term performance (Lakonishok and Lee 2000), and insider selling tends to follow positive quarterly earnings news (Sivakumar

and Waymire 1994), both of which are consistent with a pattern of pre-sale information management.

More direct evidence is documented in Beneish, Press and Vargus (2004, BPV) and Bartov and Mohanram (2004, BM). BPV find, for a sample of firms with subsequent debt covenant defaults, that positive abnormal accruals are used following but not preceding insider stock sales. In contrast to BPV, BM show that large insider option exercises are preceded by abnormally positive earnings and followed by poor earnings performance. They conclude that executives opportunistically manage pre-exercise earnings to increase their cash payouts, and the reversals of the pre-exercise overstatements negatively affect the post-exercise period

The findings related to option grants also suggest opportunistic information management. Several studies document strategic disclosure to manage market expectations downwards prior to option grants. For example, post-grant earnings announcements are found to be generally more favorable than pre-grant earnings announcements (Yermack 1997); analysts' forecasts issued preceding executive stock option awards are less optimistically biased than forecasts issued for the same firms during other periods, and managers appear to increase voluntary disclosure of negative news prior to option grants (Aboody and Kasznik 2000). Additional studies find abnormal positive returns following insider purchases (Seyhun 1998; Lackonishok and Lee 2001) consistent with pre-purchase or pre-grant depression of stock prices. Baker, Collins and Reitenga (2003) directly examine for and find a positive relation between negative abnormal accruals and size of subsequent CEO option grants.

2.3.3 Governance and Earnings Management

Corporate governance refers to "the relationships among management, the board of directors, shareholders, and other stakeholders in a company. These relationships

provide a framework within which corporate objectives are set and performance is monitored."[2] Each component of a firm's governance structure is determined by the other governance features and the nature of the firm's business (Jensen and Meckling 1976). Research has identified three pivotal elements of governance – the board of directors, executive compensation and outside block holders. The combination of institutional features such as accounting rules and securities regulations, and corporate governance structure should deter any inefficient earnings management that might arise as a result of managerial compensation contracting.

Several studies provide evidence that earnings management varies across board and ownership characteristics. Abnormal accruals (Klein 2002; Xie, Davidson and DaDalt 2003), positive abnormal accruals (Peasnell, Pope and Young 2000) and likelihood of financial statement fraud (Beasley 1996) decrease in the proportion of outside members on a firm's board of directors. Dechow, Sloan and Sweeney (DSS, 1996) find GAAP violators are more likely to have insider-dominated boards, a CEO who is also the chairman of the board and a CEO who is also a founder of the firm.

DSS additionally find GAAP violators are less likely to have an outside blockholder. Similar findings are documented by Koh (2003) who finds income-increasing discretionary accruals decline in institutional ownership for Australian firms with high levels of institutional ownership, and Rajgopal, Venkatachalam and Jiambalvo (2002) who show that the absolute value of discretionary accruals is negatively related to institutional ownership. Finally, Leuz, Nanda and Wysocki (2003) examine the differences in earnings management across 31 countries; they document that earnings management decreases in investor protection. Taken as a whole, these studies suggest

[2] Mehran, H., 2003. Introduction to FRBNY Economic Policy Review. April, 2003.

that governance structure impacts the financial reporting strategies employed by managers.

Executive compensation practices also vary systematically with both board structure and firm ownership. Using a sample of 153 manufacturing firms for the period 1979 to 1980, Mehran (1995) finds the proportion of executive compensation that is equity-based increases with board independence and decreases with the percentage of shares held by outside block holders. He reasons that independent directors, as more effective representatives of shareholder interests, tie more of managers' compensation to firm value through equity compensation. In addition, he suggests that block holder monitoring supplants some of the need for incentive alignment as the reason why equity compensation declines in block holder ownership. The role of outside investors in compensation design is also investigated by Hartzell and Starks (2003) who provide empirical evidence that institutional investors with large holdings influence the level and structure of executive compensation, and that institutional investors in general show a preference for firms where executives have high pay-for-performance sensitivities.

Chapter 3: Hypothesis Development

A study published in 1990 by Jensen and Murphy concluded that corporate executives' ownership of their firms was too low to provide meaningful incentives. These findings precipitated an increased emphasis on equity compensation that resulted in substantial growth in executive equity holdings during the 1990s. Hall and Murphy (2002) report that median stock and option holdings of S&P 500 executives grew from $11 million in 1992 to more than $31 million by 1999.

Jensen and Murphy (1990) point out that managerial stock ownership is desirable because it establishes a direct link between executive and shareholder wealth. The effectiveness of ownership in establishing such a link is borne out by the high sensitivity of executive wealth to stock price changes. For example, Hall and Liebman (1998) find that changes in CEO wealth from stock and option revaluations are over fifty times those from salary and bonus changes.

Regulators, shareholder advocacy groups and the financial press have expressed concern that the expanded use of stock-based wealth compensation encourages use of aggressive accounting to increase executive pay. There are three distinct ways equity compensation may generate incentives for executives to manage earnings. First, wealth sensitivity may increase executive concern with stock prices. Dechow and Skinner (2000) observes that managers' increased wealth sensitivity to stock prices has intensified incentives to manage earnings to maintain and increase stock valuations. Second, executives may be motivated to report higher earnings or to avoid earnings declines either before or after stock sales. Pre-sale earnings management would allow an executive to sell his shares at potentially inflated values, while post-sale earnings management might be used to avoid detection of insider trading. Finally, a manager

might use earnings manipulations to artificially depress stock prices prior to a stock purchase in order to purchase the shares at a discount, or prior to an option grant thereby reducing the exercise price of the option.

3.1 WEALTH SENSITIVITY AS A MOTIVE FOR EARNINGS MANAGEMENT

I define wealth sensitivity as the change in executive wealth given a one percent change in stock price. Wealth sensitivity, which provides the majority of CEO incentives to increase stock price (Hall and Liebman 1998), could potentially motivate either income-smoothing or income increasing earnings management.

Smoothing may be an effective strategy for an executive to use to maximize the value of his holdings. Empirical research uniformly documents a positive association between earnings smoothness and stock valuation. Allayanis and Weston (2003) find that a one standard deviation increase in earnings volatility is associated with a 6 to 21 percent decrease in firm value. Thomas and Zhang (2002) confirm that higher price-earnings ratios (P/E) are associated with lower earnings volatility.

Theoretical models explore a variety of explanations for the relation between smooth earnings and stock value. For example, Goel and Thakor (2003) model smoothing as a means of reducing the informational advantages of informed outside investors thereby minimizing the expected losses to liquidity trading. Ronen and Sadan (1981) consider smoothing as providing a credible signal of higher quality earnings. Trueman and Titman (1988) suggest smooth earnings reduce perceived probabilities of default and therefore decrease borrowing costs.

All these studies suggest that CEOs with significant ownership interests in their firms have incentives to smooth earnings to maximize their wealth and to maximize the proceeds from their unplanned liquidity sales. Furthermore, the valuation effects of smoothing benefit all shareholders consistent with incentive alignment.

On the other hand, the wealth-implications of share price movements may cause a manager to become focused on current stock price and take actions to bolster short-term value by inflating reported earnings. Such behavior is consistent with Stein's (1989) model of the myopic manager who uses income-increasing earnings management to increase short-term stock price, and the Bolton, Scheinkman and Xiong (2003) model where, in speculative markets, a CEO may take actions that encourage speculation to increase stock price in the short run. In their model managers pursue actions that are likely to cause divergence in investor beliefs in order to increase speculative value.

Prior research indicates income-increasing earnings management may be effective at raising stock values. Barth, Elliott and Finn (1999) find that firms with patterns of continuous earnings growth are priced at a premium, the premium increases monotonically with the length of the growth pattern, and the premium decreases substantially when the pattern is broken. Other studies document that firms that meet or beat analyst forecasts enjoy a quarterly stock return premium of 3% (Bartov, Givoly and Hayn 2000), while missing an earnings benchmark is associated with a precipitous decline in value, particularly for growth stocks (Skinner and Sloan 2000). Furthermore, a substantial body of evidence documents that income-increasing accruals are priced (Sloan 1996; Beneish and Vargus 2002; Bradshaw, Richardson and Sloan 2001).

Consequently, income-increasing earnings management might also be motivated by executive wealth sensitivity to stock price. If earnings management is used to maximize equity-based wealth I expect the incentive to manage earnings will increase in wealth sensitivity. The hypothesis (in alternate form) is

H1a: Income-increasing or income-smoothing earnings management is positively associated with executive wealth sensitivity to stock price.

3.2 STOCK SALES AND EARNINGS MANAGEMENT

One problem with use of an income-increasing earnings management strategy is that accounting accruals, the most flexible mechanism for managing earnings within the limits of Generally Accepted Accounting Principles (GAAP), reverse over time. Continuous inflation of earnings requires increasingly aggressive accounting manipulations leading to a "bloated" balance sheet (Barton and Simko 2002). However, intermittent manipulation of accruals may afford executives the opportunity to optimize planned transactions without facing balance sheet constraints.

First, if a manager sells shares based on proprietary knowledge about current or future firm performance, earnings management may be used post-sale to prevent earnings declines that would arouse suspicion that the trade was based on material inside information. Insider trading regulations are designed to discourage insiders from using their informational advantages for personal gain. Enforcement of the regulations and shareholder litigation related to insider trading has historically focused on insider stock transactions occurring prior to information releases because that is the time when information asymmetry is considered to be greatest. As a consequence, an executive who sells based on foreknowledge of value decreasing news has incentives to distance the sale from an anticipated earnings decline. Evidence that insider sales are more predictive of long-term performance than short-term performance (Lakonishok and Lee 2000) is consistent with such a strategy.

Two additional studies provide evidence consistent with post-sale earnings management by insiders. Ke, Huddart, and Petroni (2003) find that insiders sell stock as long as two years prior to a break in an earnings growth string, but appear to avoid trades in the two quarters immediately preceding the break. For a sample of firms that subsequently experience a technical default, Beneish, Press and Vargus (2003) find

evidence of income-increasing earnings management following abnormal selling but not preceding abnormal selling. They conclude that executives use earnings management to distance their sales from the default.

Second, earnings management may be used prior to execution of a sale in order to bolster stock prices or to avoid value-decreasing earnings surprises. The incentive to report good news or to avoid reporting bad news prior to insider sales is readily apparent. In addition, many firms have internal policies restricting trading by insiders to periods immediately following earnings reports (Bettis, Coles and Lemmon 2000). Such limitations may increase pressure on managers desiring to sell stock to seek value increasing surprises and avoid value decreasing surprises in the announcements immediately preceding planned sales. Evidence suggestive of possible management of earnings and/or disclosures prior to insider equity sales is found in several studies (Sivakumar and Waymire 1994; Summers and Sweeney 1998; Beneish 1999; Beneish and Vargus 2001; Noe 2000). Therefore, stock sales may motive earnings management in pre- and post-sale periods.

H2a: *Income-increasing earnings management is used prior to or following executive stock sales.*

3.2 EQUITY ACQUISITIONS AND EARNINGS MANAGEMENT

Managers may also opportunistically manage earnings preceding option grants and open market stock purchases. Options are typically granted with an exercise (strike) price fixed at, or tied to, the stock price on the date of grant. Since the value of an option depends primarily on the spread between the market and exercise prices, there is an incentive to minimize the share price on the grant date. Several studies document strategic disclosure to manage market expectations downwards prior to option grants. For example, post-grant earnings announcements are found to be generally more favorable

than pre-grant earnings announcements (Yermack 1997), analysts' forecasts issued preceding grants are less optimistically biased than forecasts issued for the same firms during other periods, and managers appear to increase voluntary disclosure of negative news prior to option grants (Aboody and Kasznik 2000). On the other hand, it is highly uncertain whether the benefits of earnings management prior to a grant would ever be realized since most options cannot be exercised until several years following the grant.

Similarly, if a manager is planning to acquire shares through an open market purchase he may be able to artificially depress stock prices using income-decreasing earnings management. Studies find abnormal positive returns following insider purchases (Seyhun 1998; Lackonishok and Lee 2001) suggesting insiders purchase shares they believe are undervalued; such undervaluation could result if deliberate actions are taken to depress stock prices prior to a stock purchase. In total, the above research suggests that managers may behave opportunistically by taking actions that depress stock prices prior to option incentive awards and open market purchases.

H3a: *Managers use income decreasing earnings management prior to option grants and stock purchases.*

3.4 GOVERNANCE AS A CONSTRAINT ON EARNINGS MANAGEMENT

Positive accounting theory predicts that managers make accounting choices that are either efficient or opportunistic; efficient choices increase the wealth of all contracting parities whereas opportunistic choices make the manager better off at the expense of some other stakeholder(s) (Watts and Zimmerman, 1990).

The set of acceptable accounting practices and the potential to use reporting discretion opportunistically are limited by both institutional and firm-specific constraints. Institutional constraints arise primarily from SEC regulations that implement the provisions of the Securities Exchange Acts of 1934; their requirements, which apply to

all publicly held firms, mandate public filing of audited financial statements prepared in accordance with GAAP and place restrictions on insider trading. In addition, state and local laws, which vary across jurisdictions, also impose restrictions and requirements on corporations. The institutional features faced by a firm are relatively fixed. On the other hand, governance is self-selected and is tailored to discourage executive behavior that is harmful to shareholders. In total, the combination of institutional features and corporate governance structure should serve to limit any inefficient earnings management that might arise as a result of managerial compensation contracting.

Corporate governance refers to "the relationships among management, the board of directors, shareholders, and other stakeholders in a company. These relationships provide a framework within which corporate objectives are set and performance is monitored."[3] Each component of a firm's governance structure is determined by the other governance features, the environment the firm operates in and the nature of the firm's business (Jensen and Meckling 1976). Research has identified three pivotal elements of governance – the board of directors, executive compensation and outside block holders. Each of these elements has been documented to influence both abnormal accrual use and compensation design.

Several studies provide evidence that earnings management varies across board and ownership characteristics. Abnormal accruals (Klein 2002; Xie, Davidson and DaDalt 2003), positive abnormal accruals (Peasnell, Pope and Young 2000) and likelihood of financial statement fraud (Beasley 1996) decrease in the proportion of outside members on a firm's board of directors. Dechow, Sloan and Sweeney (DSS, 1996) find GAAP violators are more likely to have insider-dominated boards, a CEO who is also the chairman of the board and a CEO who is also a founder of the firm.

[3] Mehran, H., 2003. Introduction to FRBNY Economic Policy Review. April, 2003.

DSS also find GAAP violators are less likely to have an outside blockholder. Similar findings are documented by Koh (2003) who finds income-increasing discretionary accruals decline in institutional ownership for Australian firms with high levels of institutional ownership, and Rajgopal, Venkatachalam and Jiambalvo (2002) who show that the absolute value of discretionary accruals is negatively related to institutional ownership. Finally, Leuz, Nanda and Wysocki (2003) examine the differences in earnings management across 31 countries; they document that earnings management decreases in investor protection. Taken as a whole, these studies suggest that governance structure impacts the financial reporting strategies employed by managers.

Executive compensation practices also vary systematically with both board structure and firm ownership. Using a sample of 153 manufacturing firms for the period 1979 to 1980, Mehran (1995) finds the proportion of executive compensation that is equity-based increases with board independence and decreases with the percentage of shares held by outside block holders. He reasons that independent directors, as more effective representatives of shareholder interests, tie more of managers' compensation to firm value through equity compensation. In addition, he suggests that block holder monitoring supplants some of the need for incentive alignment as the reason why equity compensation declines in block holder ownership. The role of outside investors in compensation design is also investigated by Hartzell and Starks (2003) who document that institutional investors with large holdings influence the level and structure of executive compensation, and that institutional investors in general show a preference for firms where executives have high pay-for-performance sensitivities.

Since the primary purpose of managerial ownership is incentive alignment, self-interested behavior arising from the incentive effects of ownership may be an expected

outcome of efficient contracting. In particular, income-smoothing is typically modeled in the theoretical literature as a value maximizing strategy (e.g. Goel and Thakor 2003) and has been documented in empirical research to be positively related to stock valuations (Thomas and Zhang 2002; Allayannis and Weston 2003).

On the other hand, providing managers with discretion over reported earnings when earnings impact their wealth and/or consumption creates a potential agency conflict. Furthermore, regulators take a dim view of earnings management even when it is likely to benefit shareholders. For example, the SEC defines inappropriate earnings management without qualification as "the practice of distorting the true financial performance of the company."[4] Arthur Levitt, then Chairman of the SEC, specifically condemns the practice of smoothing in his speech to the NYU Center for Law and Business on September 28, 1998, stating, in reference to reporting abuses, that "trickery is employed to obscure actual financial volatility…this in turn masks the true consequences of management's decisions."[5] Thus, earnings management that is otherwise value increasing may impose costs on shareholders if it is discovered.

Therefore I also predict that, conditional on the observed earnings management being inefficient,

H1b: *The association between wealth sensitivity to stock price and earnings management is decreasing in strength of corporate governance.*

H2b: *Use of income-increasing management around stock sales declines in strength of corporate governance.*

H3b: *Use of income-decreasing management preceding option grants and stock purchases declines in strength of corporate governance.*

[4] SEC rule 32-41987 dated January 10, 2000 available at www.sec.gov.
[5] Available at www.sec.gov.

Chapter 4: Empirical Investigation of the Relation between Executive Wealth Sensitivity to Stock Price Changes and Earnings Management

Three sets of hypotheses were developed in Chapter 3. This chapter presents the research design and findings for hypotheses 1a and 1b which predict an association between executive wealth sensitivity and earnings management, as well as the expected influence of corporate governance quality on this association.

H1a: Income-increasing or income-smoothing earnings management is positively associated with executive wealth sensitivity to stock price.

H1b: The association between wealth sensitivity to stock price and earnings management is decreasing in strength of corporate governance.

4.1 Sample Selection and Data

I test my hypotheses using a sample of corporate CEOs and CFOs drawn from the Standard & Poor's 1500 firms as of January 1995. CEOs and CFOs are chosen because they have both the ability and opportunity to influence financial reports.[6]

The sample selection procedure is summarized as follows. First, financial firms, firms in regulated industries, and real estate investment trusts are eliminated because they are likely to have unique incentives to manage earnings and/or their balance sheet structure is not suited to the abnormal accruals model used to construct the dependent variables. Second, firms lacking required non-compensation data are dropped from the sample.

Third, firms without an adequate time series of proxy filings are also eliminated. Measurement of option-based wealth sensitivity to stock price changes requires vesting data which I construct using a time series of compensation disclosures from annual proxy

[6] This is substantiated by the Sarbanes Oxley Act of 2002 requirement that both CEOs and CFOs of public companies certify that their firms' financial statements are not misleading.

statements. Beginning with filings for fiscal 1992, the SEC expanded proxy disclosure requirements related to compensation and equity ownership of the five most highly compensated executives of public companies. The necessary option grant data is not generally available prior to this time. Firms that do not have proxy filings extending back to 1993 (filings for 1992) are dropped from the potential sample pool.

A sample of 410 firms is randomly selected from the firms that remain after these eliminations. The resulting sample consists of 1661 (1249) firm-year observations representing 410 (304) distinct firms with 475 (330) unique CEOs (CFOs) for the four year period 1996 through 1999. A number of the sample firms do not include CFOs among the top five executives, resulting in a reduced sample size for CFOs. Executive equity holdings and governance data are collected for 1996 through 1999. Financial data cover 1996 to 2000.

4.1.1 Measures of Earnings Management

My primary earnings management proxy for tests of Hypothesis 1 is annual discretionary current accruals. Discretionary, or abnormal, accruals are identified using an accruals expectation model based on the cross-sectional version of the Jones model used by DeFond and Jiambalvo (1994), as modified by Beneish (1998).[7]

I estimate industry- and period- specific parameters by regressing current accruals on net income and change in cash sales for each firm *i* in period *t*. Equation (1a) is estimated for each two digit SIC code and calendar period combination using all Compustat industrial firms, except the sample firms, with annual sales and total assets

[7] DeFond and Jiambalvo (1994) use the Dechow (1995) modification of the Jones model which regresses accruals on change in sales to estimate the model parameters but uses change in sales less change in accounts receivable in the prediction model. Beneish (1998) points out that abnormal accruals are likely to be overstated when sales are used for estimation, but adjusted sales for prediction, and that the economic meaning of the prediction model sales proxy, which is equivalent to cash sales minus prior period accrual sales, is ambiguous. In order to capture revenue based earnings management, I use change in cash sales in both the estimation and prediction models.

falling in the same size ranges as those of the sample firms. Industries are classified according to Barth, Beaver and Landsman (1998), hereafter referred to as BBL SIC codes).

$$CA_{it} = \gamma_0 + \gamma_1 \Delta CS_{it} + \gamma_2 NI_{it-1} + \varepsilon_{it} \quad (1a)$$

where CA_{it} are current accruals for firm *i* in period *t*, NI_{it-1} is lagged net income (Compustat item 172), and ΔCS_{it} is change in cash sales from period *t-1* to period *t*. All variables including the intercept are scaled by *t-1* total assets (Compustat item 6).

Current accruals equal the difference between net working capital at period-end *t* and net working capital at period-end *t-1*, where net working capital is computed as the sum of accounts receivable (Compustat item 2), inventory (Compustat item 3), and other current assets (Compustat item 68) less the sum of accounts payable (Compustat item 70), accrued tax liabilities (Compustat item 71) and other current liabilities (Compustat item 72).[8] Change in cash sales is equal to the cash collections for period *t* less the cash collections for period *t-1*. Cash collections are sales minus the change in accounts receivable.

Since my partitioning variable, executive wealth sensitivity, is likely to be correlated with firm performance, I include lagged return on assets, calculated as prior period net income divided by beginning total assets, to control for firm performance. Kothari, Leone and Wasley (2002) find use of performance matched discretionary accruals improves the specification of earnings management tests by controlling for the

[8] Hribar and Collins (2002) recommend use of changes in working capital accounts from the statement of cash flows in accrual estimation models because balance sheet accruals are not consistently adjusted for the influence of mergers and acquisitions, divestitures and/or foreign currency translation. However, statement of cash flow amounts are often missing in Compustat records. Accordingly, I use balance sheet working capital changes and eliminate firms with changes in working capital exceeding 25% of total assets from the accruals estimation sample.

effects of firm performance on accruals. They find the second best model is one that includes lagged return on assets as a regressor. Because performance matching would require extensive additional hand collection of data, I use the latter alternative.

The industry- and period- specific parameter estimates obtained from equation (1a) are used to predict the expected accruals, E[*CA*], for each sample firm using equation (1b). Abnormal accruals (*EM*) are the difference between predicted and actual accruals as specified in equation (1c). Consistent with the estimation procedure, all terms are scaled using *t-1* total assets.

$$E[CA_{it}] = \hat{\gamma}_0 + \hat{\gamma}_1 \Delta CS_{it} + \hat{\gamma}_2 NI_{it-1} \quad (1b)$$

$$EM_{it} = CA_{it} - E[CA_{it}] \quad (1c)$$

The difference between the actual and predicted accruals, *EM*, is assumed to be discretionary, or "abnormal" accruals. For tests of hypotheses 1a and 1b I first use the absolute value of abnormal accruals (|*EM*|) to look for evidence of a relation between equity-based wealth sensitivity and unsigned abnormal accrual magnitude. To gain insights into the specific nature of the earnings management, I then examine the associations of the wealth sensitivity measures with positive and negative abnormal accruals. Abnormal accruals may be used to manage earnings in two ways. First, positive abnormal accruals (EM^+) may be used to increase earnings or to avoid negative earnings surprises. Second, negative abnormal accruals (EM^-) may be used to create reserves for future use or to avoid positive earnings surprises. In addition, the accrual measurement model is likely to generate negative (positive) abnormal accruals as prior period positive (negative) abnormal accruals reverse.

I replicate my empirical tests using two alternative abnormal accruals measures. The first measure is total abnormal accruals, calculated using equation (2a) to estimate

the industry-period parameters, equation (2b) to compute the expected total accruals for the sample firms and equation (2c) to measure discretionary total accruals. The chief advantage of this model is that total accruals are measured using income statement and cash flow statement measures, helping to mitigate the measurement error associated with balance sheet amounts described in Hribar and Collins (2002). On the other hand, manipulation of non-current accruals, which are dominated by depreciation, is transparent and not likely to be employed as an earnings management tool.

$$TA_{it} = \gamma_0 + \gamma_1 PPE_{it} + \gamma_2 \Delta REV_{it} + \gamma_3 NI_{t-1} + \varepsilon_{it} \quad (2a)$$

$$E[TA_{it}] = \hat{\gamma}_0 + \hat{\gamma}_1 PPE_{it} + \hat{\gamma}_2 \Delta REV_{it} + \gamma_3 NI_{t-1} \quad (2b)$$

$$EM_{it} = TA_{it} - E[TA_{it}] \quad (2c)$$

where TA_{it} are total accruals for firm *i* in period *t*, ΔREV_{it} is the difference between revenues (Compustat item 12) in periods *t* and *t-1*, PPE_{it} refers to gross property, plant and equipment (Compustat item 7) and NI_{it-1} is lagged net income. Total accruals are computed as the difference between earnings before extraordinary items (Compustat item 123) and cash flow from operations (Compustat 308) adjusted for cash flow from discontinued operations (Compustat 124). As before, all variables including the intercept are scaled by *t-1* total assets.

The second alternate abnormal accruals measure employs a cross-sectional model with the Dechow (1995) modification of the Jones model for current accruals. The Dechow (1995) modification uses change in accrual sales in parameter estimation, and the change in accrual sales adjusted by the change in accounts receivable to calculate expected accruals. I also drop the return on assets term from both the estimation and measurement models for this final abnormal accruals model.

Results using both alternatives are qualitatively similar to those obtained with the primary model. In general, the statistics for most test variables improve for the Dechow

modification, suggesting either improved specification or correlation between the regressors and model measurement error.

4.1.2 Measures of Wealth Sensitivity

I expect the change in firm value for a given level of executive earnings management effort to increase in firm size. In particular, I assume a given level of earnings-management effort results in a relatively constant percentage change in firm value across firms and over time. Therefore, my measure of wealth sensitivity is the dollar change in the executive's wealth given a marginal percentage change in stock price (Baker and Hall 2003). Total sensitivity is the expected change in the value of an executive's equity holdings, given a one percent change in stock price, where equity holdings consist of stock and stock options. Stock-based wealth sensitivity to equity price change is equal to the number of shares held by the executive times the stock price times 0.01 (1.0%). Option-based wealth sensitivity is the change in the value of the CEO's option holdings given a one percent change in stock price.

Consistent with other studies (Hall 1998; Guay 1999; Core and Guay 1999), option values are estimated using the Black Scholes option pricing formula, as modified by Merton (1973) to adjust for dividend payments. The option vesting schedules, maturities and strike prices required for calculating Black Scholes values are collected from proxy statements. Options predating 1992 that remain in an executive's portfolio during the study period are assumed to have the same vesting schedule and to be granted at the end of the same calendar month as the earliest awards on record for that individual. Dividend yields, volatilities and stock prices are calculated using CRSP data, and risk-free rates (90 day constant maturities) are obtained from the Federal Reserve. Details of the Black Scholes calculations are provided in Appendix A.

Option-based wealth sensitivity (*Option Sensitivity*) is computed individually for each CEO and CFO of firm *i* as the sum, over the *n* grants in an executive's option portfolio, of the Black Scholes delta for each option grant *k* times the number of options *s* in the grant times one percent of the stock price:

$$Option\ \ Sensitivity_i = \sum_{k=1}^{n}\left[\frac{\partial Value_k}{\partial Price_i} \times \frac{Price_i}{100} \times s_k\right] \qquad (3)$$

I expect the importance of the wealth effect of a CEO's equity revaluation to be related to how material the revaluation is relative to the CEO's other sources of income. Accordingly, I scale the sensitivity measures by the sum of the executive's salary and bonus. While incentive intensity may be tempered by income from other sources, in light of the magnitude of the sample CEOs' equity holdings in their firms, it is not likely that they have sufficient non-firm income-generating assets to materially alter their incentives (Baker and Hall 1998).

I replicate my tests using four alternate transformations of the sensitivity measures including the natural log of the sensitivity measures, sensitivity scaled by salary alone and sensitivity scaled by the value of the executive's holdings. These three measures yield results that are qualitatively to those reported using the salary plus bonus deflator. The final measure employed uses the firms' market value of equity as a deflator for the sensitivity measures to approximate the percentage of firm owned measure in Cheng and Warfield (2004). I find the sensitivity coefficients are not statistically significant at conventional levels for this final alternative; however, this rescaling alters the theoretical construct being tested.

4.1.3 Measures of Governance Strength

I use governance characteristics that have been shown to influence abnormal accrual usage to construct my governance strength variable (*Governance Score*). These characteristics fall into three categories – board structure, ownership structure and institutional environment.

The most fundamental responsibility of the board of directors is to monitor the actions of corporate executives on behalf of the shareholders. Accordingly, I include three measures of board structure in the governance variable. First, the empirical literature presents pervasive evidence that outside directors are more effective as monitors of management than inside directors so I use the fraction of outside directors as one measure of board quality. I consider directors that are employed by the firm, retired or former executives, relatives of the CEO, and consultants and attorneys employed by the firm as inside directors. All other board members are classified as outside.

I use board size, measured as the number of directors on the board, as a second measure of board quality. Jensen (1993) suggests that large boards are likely to have weak governance structures while Yermack (1996) and Eisenberg, Sundgren and Wells (1998) show that firms with small boards perform better than firms with large boards.[9] Finally, active boards are considered better overseers of management than their less active counterparts. In particular, Xie, Davidson and DeDalt (2003) document a negative relation between earnings management and frequency of board meeting. Number of meetings is included as the final board quality measure. Some board data are obtained from Execucomp, the balance are hand collected from proxy filings.

[9] Jensen also suggests that boards where CEOs serve as chairmen also have weak governance. The majority of the sample firms' CEOs serve as chairmen so this variable is not included in governance score due to the limited cross-sectional variation.

Prior literature reveals that outside blockholders play monitoring roles such that firms with influential external owners have stronger governance than those without significant investors (Core, Holthausen and Larcker 1999). I use the fraction of shares owned by institutions as a proxy for influential outside ownership. Institutional holdings data are obtained from the Thomson Financial Institutional (13F) database. Holdings data are not available for 49 firm-years.

I use the G score developed in Gompers, Ishii and Metrick (2003) as my proxy for institutional environment, the final characteristic included in the governance measure. The G score, which I obtain from Andrew Metrick's website, is a measure of shareholder rights constructed using 24 corporate-governance provisions obtained from the Investor Responsibility Research Center. The provisions used to construct the G score fit into five categories described by Gompers et al. (2003) as tactics for delaying hostile bidders, voting rights, director/officer protection, other takeover defenses, and state laws. While the G score theoretically ranges from 0 to 24 with 0 (24) indicating strong (weak) shareholder rights and therefore implying strong (weak) governance, the G score for the sample firms ranges from 0 to 16. Scores are not available for 340 firm-years.[10]

I combine these five variables, or factors, into BBL SIC specific composite governance proxies as follows. First, I standardize each of the variables (mean 0, variance 1) by BBL SIC code. Next, I use principal component analysis to identify the first principal component, which I use as the basis for my governance measure. The principal component analysis generates a factor loading, or weight, for each variable. The product of the factor loadings vector with the vector of the factor values for each observation generates the governance score variable used in my tests. To avoid excessive data loss, I

[10] Details regarding the construction of the G score are found in Gompers et al. (2003). For 1998, the last period the G score is computed, Gompers et al. (2003) report a score range of 2 to 18, with mean and median scores of 8.9 and 9, respectively.

replace missing values for institutional holdings and G score with their industry means. Results of tests including and excluding the observations with replacement values are not materially different.

Table 1 summarizes the correlations between the factors, as well as the factor loadings for each industry grouping. The first principal component explains between approximately 27% and 50% of the variance in the set of variables. The distributions of the loadings on, and simple correlations between, the five governance factors vary by BBL SIC, suggesting systematic differences in governance practices across industries.

4.1.4 Control Variables

Theory and prior empirical research suggest that earnings management is associated with a number of factors that are likely to be correlated with equity incentives. In order to control for these factors I use multivariate regressions that include the variables discussed below.

Cash bonuses are generally based on accounting measures and have been associated with earnings management in previous studies (Healy 1985; Gaver, Gaver and Austin 1995; Holthausen, Larcker and Sloan 1995). Bonus income may also be correlated with equity incentives since the performance measures on which the bonus is based may also have valuation implications. I control for possible bonus effects by including the executive's bonus scaled by the sum of salary and bonus.

Compensation policy and earnings management are both associated with firm size. Executive actions are less observable and corporate governance tends to be stronger for large complex businesses, suggesting that incentive based compensation is more intensive for large firms than for small firms. In addition, large firms are priced more efficiently than small firms (Lakonishok and Lee 2001) and have richer information environments both of which imply smaller rewards to earnings managements. The proxy

I use to control for firm size is the natural logarithm of the beginning of period market value of equity. Also, since marginally profitable firms are more likely to use abnormal accruals (Burgstahler and Dichev 1997) I include return on assets to control for firm profitability.

Firm growth is also strongly linked to both equity incentive use and earnings management. Management of investment opportunities is particularly difficult to monitor so firms with growth opportunities are more incentive intense (Kedia and Mozumdar 2002; Smith and Watts 1992). In addition, growth opportunities are associated with high price to earnings multiples, increasing the potential valuation impact of earnings management. Finally, use of accruals to manage earnings is less transparent for firms with dynamic financial performance and the reversal of managed accruals is masked by growth. I use the market to book ratio, computed as the market value of common equity divided by the book value of common equity, as my proxy for growth opportunities.

Empirical research documents that firms with financing needs and firms approaching debt covenant default triggers have higher levels of abnormal accruals (Healy and Wahlen 1999), a higher incidence of GAAP violations (Dechow, Sloan and Sweeney 1996) and a higher likelihood of committing accounting fraud (Erickson, Hanlon and Maydew 2003). To control for financing related earnings management I include debt to total assets in my regressions.

Finally, I include stock volatility, measured as the annualized standard deviation of the natural logarithm of stock returns for the last 120 trading days of the fiscal year, to control for risk. Both wealth sensitivity and abnormal accruals are related to risk. Risk impacts wealth sensitivity through its effect on cost of capital, through Black Scholes option values and through the relation between risk and compensation structure. In addition, return volatility is positively correlated with earnings volatility (Lev and

Kinutzky 1974; Thomas and Zhang 2002) which could influence abnormal accruals in two ways. First, earnings swings are likely to increase abnormal accruals due to measurement error. Second, volatile earnings are costly and may motivate use of accruals to produce a smoother earnings pattern. Appendix B provides definitions for all variables used.

4.1.5 Descriptive Statistics

Descriptive statistics for the sample firms (Panels A and B) and their executives (Panel C) are presented in Table 2. Panel A of Table 2 shows the breakdown of observations by industry. The largest concentration of observations comes from durable manufacturers followed by retailers. Pharmaceutical and computer related businesses comprise approximately 18% of the sample.

As shown in Panel B, the sample firms are relatively large with a mean (median) market value of equity of $10.6 ($1.9) billion, and profitable with mean (median) return on assets of 6.5% (7.2%). My selection process favors large firms with stable operations since I require firms in continuous operation from 1992 through 2000. Any resulting selection bias may limit generalizability of my findings to other firms, but should not compromise my inferences which are based strictly on within-sample comparisons.

Consistent with their financial characteristics, institutional ownership of the sample firms is considerable. On average, 62% of the outstanding common shares is held by institutional investors. The sample mean G score of 8.53 is lower than mean of 8.9 found by Gompers et al. (1998), indicating my sample has somewhat stronger shareholder protection than the population of rated firms as a whole.

Panel C of Table 2 summarizes compensation levels and wealth sensitivities for the CEOs and CFOs. For CEOs, the average annual cash compensation (salary plus bonus) is slightly more than $1.2 million while the median is approximately $946

thousand. All but 24 (34) of the CEOs hold shares of stock (options) and less than one-quarter own restricted stock at some point during the four-period period with the incidence of restricted ownership concentrated in 1999. Due to the high frequency of zero values, restricted stock-based wealth sensitivity is not separately examined in my empirical tests, but is included as a component of stock-based wealth sensitivity.

Both mean and median wealth sensitivities for the CEOs are substantial. The average (median) executive's wealth changes by $766 ($206) thousand when the firm's stock price moves 1%. The wealth sensitivity effects of options exceed those of stock at each quartile break; however, a limited number of executives with large stock holdings drive the mean stock-based wealth sensitivity to a higher value than the mean for option-based wealth sensitivity.

The CFOs earn approximately one-half the salary and one-third the bonus income of CEOs. The most striking differences between the executive types are in their equity holdings and wealth sensitivity measures. The average number of shares owned by a CFO is less than two percent of the CEO amount. CFO option holdings are also markedly smaller than CEO option holdings. However, CFO option holdings exceed their stock holdings and provide the dominant source of CFO wealth sensitivity.

Mean equity holdings and wealth sensitivities of both CEOs and CFOs are heavily influenced by values at the upper ends of the distributions. Accordingly, I winsorize the sensitivity values used in the following empirical tests at the 95^{th} percentile.

4.2 EMPIRICAL ANALYSES

The objectives of the following analyses are to determine if abnormal accruals are systematically related to executive wealth sensitivity, whether corporate governance quality influences this relation, and whether the characteristics of the abnormal accrual patterns are consistent with income-increasing and/or income-smoothing. In section 4.2.1

I examine the correlations between absolute abnormal accruals and wealth sensitivity, and absolute abnormal accruals and governance. I then examine the relation between wealth sensitivity and abnormal accrual magnitudes and the influence of governance on the relation using a multivariate model that controls for other factors that may be related to abnormal accruals or executive wealth sensitivity; these tests and results are described in section 4.2.2. In Section 4.2.3 I expand the analysis of Section 4.2.2 by separately examining positive and negative abnormal accruals. Finally, Section 4.2.4 presents tests for income-smoothing.

Prior to performing the following analyses, I standardize all variables by executive type and industry. The formula to compute the standardized values is $x'_{ij} = \left(x_{ij} - \bar{x}_j\right) / s_{x_j}$, where x_{ij}' represents the standardized value of the variable x for observation i, $\bar{x}_j$ represents the mean of x for industry j, and s_{x_j} is the standard deviation of x for industry j. This standardization serves three purposes: First, it transforms the limited dependent variables - $|EM|$, EM^+ and EM^- - to variables with infinite support; second, it controls for inter-industry heterogeneity; and third, it provides regression coefficients that are comparable across regressors. Unless otherwise noted, all variables in the following discussions are standardized.

4.2.1 Univariate Relations

I first evaluate whether abnormal accruals vary with wealth sensitivity by examining a plot of the relation between total sensitivity quintile and abnormal accruals. Total sensitivity is the effect of a 1% change in period *t* ending stock price on executive wealth. Abnormal accruals are measured using a cross-sectional Jones model, as described in section 4.1.1. Because I am interested in evaluating wealth sensitivity as a potential incentive for earnings management, my sensitivity measures are calculated at the end of period *t* while my abnormal accruals are measured in period *t+1*.

Since the abnormal accrual measures have been standardized, the sample mean has a value of zero. Figure 1 shows that absolute abnormal accruals are slightly below sample means for the four lowest sensitivity groups, but markedly higher than the sample mean for the highest sensitivity group. The pattern for positive abnormal accruals closely parallels that for absolute abnormal accruals. Positive abnormal accruals are below the sample mean for low sensitivities, near the sample mean for moderate sensitivities and above the mean for high sensitivities. Negative abnormal accruals are generally higher than the mean (i.e. smaller in magnitude than the mean) except at the high end of the wealth sensitivity distribution where they are well below average.

In addition, the sensitivity-abnormal accrual relations appear to be non-linear. While CEO abnormal accruals appear to vary systematically with total sensitivity, visual evaluation of the plot for CFOs reveals little evidence of a pattern, although abnormal accrual magnitudes appear to be smallest for the highest sensitivity quintile.

Next, I examine the simple correlations between variables. The correlation matrix appears in Table 3. Pearson correlations for CEOs (CFOs) appear above (below) the diagonal. I do not tabulate the rank correlations; however, the Spearman correlations generally yield the same sign, relative magnitude and level of statistical significance as the Pearson measures.

If wealth sensitivity to stock price motivates executives to manage earnings using abnormal accruals, I expect to observe significant correlations between total sensitivity and the magnitude of abnormal accruals. Table 3 reports a Pearson correlation of 0.0878 ($p=0.0103$) between absolute abnormal accruals and CEO total sensitivity consistent with the prediction that abnormal accrual usage increases in CEO wealth sensitivity; however, the magnitude of the correlation is small. The abnormal accrual-wealth sensitivity correlation is negative, but not statistically significant for CFOs.

Prior research documents a negative association between abnormal accrual levels and governance strength. I find a negative correlation between abnormal accruals and governance score, consistent with governance serving as a constraint to manipulation of earnings through use of accruals. Furthermore, the magnitude of the correlation between governance and abnormal accruals suggests a stronger relation than that between total wealth sensitivity and abnormal accruals.

Based on my discussion in section 4.1.4 of the various control variables, I expect the earnings management to decrease in firm size. As expected, abnormal accruals are negatively correlated with market capitalization. The expected relation between return on assets (ROA) and abnormal accruals is less clear. First, if highly profitable firms have fewer incentives to manage earnings, the correlation between ROA and abnormal accruals will be negative. On the hand, if abnormal accruals are used to meet target ROA then abnormal accrual magnitudes might increase in ROA resulting in a positive correlation with abnormal accruals. Finally, if abnormal accrual measurement error is correlated with profitability, the correlation between abnormal accruals and ROA will also be positive. The observed correlations for the CEO sample are consistent with both the measurement error and earnings management explanations.

I expect market to book to be positively correlated with abnormal accruals since the rewards to earnings management increase in market to book. Because market to book is associated with earnings growth, if the abnormal accruals measurement model does not fully adjust for growth, the abnormal accruals will be positively biased which could induce a positive correlation between market to book and the *values* of both positive and negative abnormal accruals. The impact on absolute abnormal accruals is ambiguous since the positive accruals will have greater magnitudes but the negative accruals will have smaller magnitudes. On the other hand, if earnings management is directly related to

growth, the *magnitudes* of both positive and negative abnormal accruals will be larger generating a positive correlation between absolute abnormal accruals and the market to book ratio, as observed for the CEO sample. While directionally consistent with this pattern, the CFO correlation is not statistically significant.

The expected correlation between absolute abnormal accruals and debt to assets is not clear. The use of income-increasing earnings management to avoid default triggers is expected to increase in leverage; but I expect either a negative relation or no relation between negative abnormal accrual magnitudes and leverage. Contrary to expectations, debt to assets is negatively correlated with abnormal accruals suggesting that earnings management is less prevalent among the high leverage firms than the low leverage firms.

4.2.2 Multivariate Tests

The multivariate regressions test the relation between the wealth sensitivity and abnormal accruals, examine the effect of corporate governance on this relation, and control for other determinants of abnormal accruals that are likely to be correlated with equity incentives. In addition, the specifications include squared wealth sensitivity terms to accommodate potential non-linearity in the abnormal accrual-sensitivity relation. For consistency of exposition, discussion of CEO results precedes discussion of CFO results for each regression analysis.

4.2.2.1 Abnormal accruals and Executive wealth sensitivity

The first multivariate regression examines the relation between total wealth sensitivity and abnormal accruals. The regression specification is detailed in equation (4).

$$EM_{it+1} = \alpha_0 + \alpha_1 Total\ Sensitivity_{it} + \alpha_2 TS_{it}^2 + \alpha_3 Bonus_{it} + \alpha_4 Size_{it} + \alpha_5 ROA_{it} + \alpha_{6it} MTB_{it} + \alpha_7 DTA_{it} + \alpha_8 Stock\ Volatility_{it} + \varepsilon_{t+1} \quad (4)$$

where EM_{it+1} = represents absolute abnormal accruals (|*EM*|) for the period following the measurement of wealth sensitivity

Total Sensitivity$_{it}$ = total wealth sensitivity, which is equal to the effect of a 1% change in period *t* ending stock price on the equity-based wealth of firm *i*'s CEO scaled by the sum of salary and bonus

TS_{it}^2 = the square of *Total Sensitivity*

$Bonus_{it}$= the bonus compensation received by the executive of firm *i* in period *t* scaled by the sum of salary and bonus

$Size_{it}$ = the natural logarithm of period *t* ending market value of equity

ROA_{it}= net income for firm *i* divided by period *t* ending total assets

MTB_{it} = firm *i*'s ending market value of equity divided by book value

DTA_{it} = the ratio of period-end total liabilities to total assets

Stock Volatility$_{it}$ = the annualized standard deviation of the natural logarithm of stock returns for the last 120 trading days of the fiscal year

The primary coefficient of interest is α_1, the coefficient on *Total Sensitivity*. If increasing sensitivity of wealth to stock price motivates executives to increase earnings through accrual manipulations I expect α_1 to be positive.

The results of pooled cross-sectional regressions are provided under the heading Equation (4) in Panel A of Table 4. The first column presents results for the regression of absolute abnormal accruals on CEO total sensitivity and the control variables. Total sensitivity is important in explaining variation in abnormal accruals with the magnitude of abnormal accruals increasing with total wealth sensitivity. The coefficient on the squared sensitivity term is opposite in sign from that on total sensitivity implying

abnormal accrual magnitudes increase at a decreasing rate with total sensitivity. The results are consistent with accrual manipulation.

In addition to my variables of interest, all control variables are significantly associated with the abnormal accrual measures. As predicted, the signs on the coefficients for size are consistent with abnormal accrual magnitudes decreasing in size. The relations of ROA and market to book with abnormal accruals agree with the simple correlations and suggest that profitability and growth are positively associated with abnormal accrual magnitudes.

In the presence of the remaining control variables, the coefficient on debt to assets assumes the expected positive sign consistent with prior research suggesting that financing needs and potential debt covenant violations serve as incentives to use accrual manipulations to manage earnings (Healy and Wahlen 1999). Finally, since volatility is a potential incentive for income-smoothing, I expect and find a significant coefficient on the volatility measure.

Results for regression of absolute abnormal accruals on CFO total sensitivity are tabulated in the second column of Panel A. No significant relations are observed. While directionally consistent with the CEO results, the coefficients on the control variables are not uniformly significant.

4.2.2.2 Effect of governance on CEO wealth sensitivity - abnormal accruals relation

Next I consider the effect of governance on the relation between abnormal accruals and total sensitivity by incorporating the governance variable, G*overnance score*, and a wealth sensitivity-governance interaction term, *TS***G*, into equation (4). This expanded model appears below in equation (5).

$$EM_{it+1} = \alpha_0 + \alpha_1 Total\ Sensitivity_{it} + \alpha_2 TS_{it} * G_{it} + \alpha_3 TS_{it}^2 + \alpha_4 Governance\ Score_{it} + \alpha_5 Bonus_{it} + \alpha_6 Size_{it} + \alpha_7 ROA_{it} + \alpha_8 MTB_{it} + \alpha_9 DTA_{it} + \alpha_{10} Stock\ Volatility_{it} + \varepsilon_{t+1} \quad (5)$$

Governance Score, as described in section 4.1.3, represents a measure of governance strength constructed from multiple governance characteristics using principal component analysis, and *TS*G* represents the interaction between *Total Sensitivity* and *Governance Score*.

If the relation between CEO wealth sensitivity and abnormal accruals decreases in governance quality, the signs for the coefficient on the interaction term, α_2, will be the opposite of the predicted sign for α_1. Results are reported under the heading Equation (5) in Panel B of Table 4. The coefficient on *TS*G*, while directionally consistent with prediction, is not significant. The results suggest that wealth driven incentives to manipulate accruals are not influenced by governance strength; however, the coefficient on governance score, α_4, confirms the simple correlation results and suggests abnormal accrual use declines in governance quality. Coefficients on the control variables are consistent with those found in prior regressions.

In total these findings imply that while governance alone appears to mitigate earnings management (i.e. α_4 is negative), strong governance does not appear to reduce the tendency of high sensitivity CEOs to use abnormal accruals (i.e. α_2 is not significant). Addition of the governance terms has little impact on CFO regression results. No significant relations are found between abnormal accruals and *Total Sensitivity*, *TS*G* or *Governance Score* for the CFO sample.

4.2.2.3 Wealth sensitivity effects related to stock and option holdings

Stock and options have different incentive effects. For example, stock ownership increases managerial risk aversion (Ofek and Yermack 2000; Guay 1999) while research

suggests that firms use options to provide risk-taking incentives (Core, Guay and Larcker 2003). In addition, Guay (1999) shows that stock return volatility can have a material effect on CEO option-based wealth sensitivity but little or no effect on stock-based wealth sensitivity. Consequently, incentives to manage earnings may vary depending on the equity instruments held. In order to allow for such potential variation *Total Sensitivity* is decomposed into stock-based wealth sensitivity, the portion of *Total Sensitivity* generated by stock holdings, and option-based wealth sensitivity, measured as the change in the Black Scholes value of the executive's option portfolio given a 1% change in stock price. The regression model detailed in equation (6), is the same as equation (5) except each of the sensitivity terms – *Total Sensitivity, TS*G* and TS^2 - are replaced with their separate stock-based (*Stock Sensitivity, SS*G,* SS^2) and option-based (*Option Sensitivity, OS*G,* OS^2) counterparts.

$$EM_{it+1} = \alpha_0 + \alpha_1 Stock\ Sensitivity_{it} + \alpha_2 SS_{it} * G_{it} + \alpha_3 SS_{it}^2 + \alpha_4 Option\ Sensitivity_{it} + \alpha_5 OS_{it} * G_{it} + \alpha_6 OS_{it}^2 + \alpha_7 Governance\ Score_{it} + \alpha_8 Bonus_{it} + \alpha_9 Size_{it} + \alpha_{10} ROA_{it} + \alpha_{11} MTB_{it} + \alpha_{12} DTA_{it} + \alpha_{13} Stock\ Volatility_{it} + \varepsilon_{t+1} \quad (6)$$

Results summarized in Panel C of Table 4 reveal the relations between the CEO total sensitivity variable and abnormal accruals found in the prior specifications are driven by the stock component as evidenced by the statistical significance of α_1, the coefficient on stock-based wealth sensitivity. The coefficient value implies that a one standard deviation change in stock-based wealth sensitivity results in an approximately one-quarter standard deviation shift in abnormal accrual magnitude. As before, the coefficient on the stock sensitivity–governance interaction term is not significant, and the coefficient on the stock sensitivity squared term is negative. Coefficients on the test variables remain insignificant for the CFOs.

CEO option-based wealth sensitivity does not explain variation in absolute abnormal accruals. The lack of findings may result if vested and unvested options generate opposing incentives. For example, vested options may be readily liquidated while unvested options expose an executive's wealth to longer-term firm performance. I conduct one more multivariate regression with option-based wealth sensitivity separated into vested and unvested portions. I define vested options as options that are vested at period *t* fiscal period-end plus options that will vest during period *t+1*. All other options are classified as unvested. *Option Sensitivity*, *OS*G* and OS^2 are replaced with their separate vested (*Vested Sensitivity*, *VS*G*, VS^2) and unvested (*Unvested Sensitivity*, *US*G*, US^2) components as shown in equation (7):

$$\begin{aligned} EM_{it+1} = {} & \alpha_0 + \alpha_1 Stock\ Sensitivity_{it} + \alpha_2 SS_{it} * G_{it} + \alpha_3 SS_{it}^2 + \alpha_4 Vested\ Sensitivity_{it} + \\ & \alpha_5 VS_{it} * G_{it} + \alpha_6 VS_{it}^2 + \alpha_7 Unvested\ Sensitivity_{it} + \alpha_8 US_{it} * G_{it} + \\ & \alpha_9 US_{it}^2 + \alpha_{10} Governance\ Score_{it} + \alpha_{11} Bonus_{it} + \alpha_{12} Size_{it} + \\ & \alpha_{13} ROA_{it} + \alpha_{14} MTB_{it} + \alpha_{15} DTA_{it} + \alpha_{16} Stock\ Volatility_{it} + \varepsilon_{t+1} \end{aligned} \quad (7)$$

Results of the regressions appear under the heading Equation (7) in Panel D of Table 4. The relation between the stock-based wealth sensitivity variables and abnormal accruals remain unchanged from the prior tests. The coefficients on both the vested and unvested sensitivity terms are insignificant. The regressions for the CFOs continue to yield few significant results.

In summary, the regressions show that CEO total equity-based wealth sensitivity is positively associated with abnormal accrual magnitudes, the association is primarily due to the sensitivity arising from stock holdings, and the relation is not materially influenced by governance strength.

Section 4.2.3 Multivariate Tests using Positive and Negative Abnormal Accruals

In order to further characterize the nature of the abnormal accrual usage, I run separate regressions for the two dependent variables – positive abnormal accruals (*EM+*) and negative abnormal accruals (*EM-*). Regressions using the models specified in Equations (4) through (7) are repeated with results reported in Panels A through D, respectively, of Table 5. The discussion in this section is limited to the results using the Equation (7) regression model.

The primary coefficients of interest are α_1, α_4, α_7, the coefficients on *Total Sensitivity, Vested Sensitivity* and *Unvested Sensitivity*. If increasing sensitivity of executive wealth to stock price motivates income-increasing earnings management I expect α_1, α_4, and α_7 to be positive for regressions of positive abnormal accruals on the sensitivity measures. Similarly, reserving of income and/or the reversal of positive abnormal accruals will result in negative values for α_1, α_4, and α_7 in regressions of negative abnormal accruals on sensitivity. Finally, if the relation between wealth sensitivity and abnormal accruals decreases in governance quality, the signs for the coefficients on the interaction terms, α_2, α_5, and α_8, will be the opposite of the predicted signs for α_1, α_4, and α_7.

Panel D of Table 5 reveals that stock sensitivity is important in explaining variation in both positive and negative abnormal accruals, and the signs on the coefficients are consistent with predictions that the magnitude of abnormal accruals increases with stock-based wealth sensitivity. Furthermore, the coefficient values suggest the relation with stock-based wealth sensitivity is similar for positive and negative abnormal accruals. As before, the coefficients on the squared sensitivity terms are

opposite in sign from those on total sensitivity implying abnormal accrual magnitudes increase at a decreasing rate with total sensitivity. The coefficient on *SS*G*, while directionally consistent with prediction for the regression with positive abnormal accruals, is not significant suggesting that wealth driven incentives to manipulate accruals are not influenced by governance strength. However, *Governance score* alone does appear to be related to abnormal accrual usage. In particular, *Governance score* is negatively related to income-increasing abnormal accruals but is not significantly related to income-decreasing abnormal accrual levels. These results are consistent with Peasnell, Pope and Young (2000) who find the likelihood of managers making income-increasing accruals is negatively related to board independence, but find little evidence that independence influences income-decreasing accruals. Coefficients on the control variables are consistent with those found in prior regressions.

As before, the coefficients on the vested option-based sensitivity terms are insignificant; however, unvested option-based wealth sensitivity is directly related to income-increasing abnormal accruals, and governance appears to attenuate the effect. CEOs with relatively high unvested option-based sensitivity may be comprised of executives with short tenure in the CEO position whose firm wealth is dominated by options granted upon assumption of the chief executive post, or may be CEOs who receive options as a substitute for cash compensation, own few shares, and sell options as they vest for consumption purposes. Preliminary findings show the executives with high unvested holdings do have shorter mean tenures and more frequent equity sales consistent with both explanations. The regressions for the CFOs continue to yield few significant results.

In summary, the regressions show that total, stock-based and unvested option-based sensitivities are associated with greater magnitudes of abnormal accruals, and except for the CEO unvested option-based wealth sensitivity, the relations are not materially influenced by governance strength. In addition, the similarity in values for coefficients on stock-based wealth sensitivity for both regressands is consistent with income-smoothing.

Section 4.2.4 Tests of Income-Smoothing

In this section, I examine whether the observed relations between CEO sensitivities and abnormal accruals can be characterized as income-smoothing. Since the univariate tests and regression analyses for CFOs provide no evidence of a relation between abnormal accruals and wealth sensitivity, I limit the smoothing tests to the CEO sample.

The significant association of both positive and negative abnormal accruals with CEO wealth sensitivity and the similarity in magnitude of the regression coefficients suggest the possibility of smoothing but could also arise in a variety of non-smoothing settings. Smoothing involves the shifting of earnings over time to eliminate extreme realizations of reported income. Therefore, if CEO wealth sensitivity provides an incentive to smooth earnings I expect, conditional on high magnitudes of abnormal accruals, firms with high sensitivity CEOs to have less earnings variability than firms with low sensitivity CEOs. I conduct two tests to evaluate smoothing.

4.2.3.1 Cross-sectional test of smoothing

My first test examines the cross-sectional relation between wealth sensitivity measures and magnitude of earnings surprises when earnings expectations are based on past earnings trends. On average, smoothed earnings should have smaller surprises than

unsmoothed earnings when earnings expectations are based on past earnings. I use a random walk with drift earnings generating process to model expected earnings. The drift term (δ) is estimated based on the average annual growth in income before extraordinary items (Compustat data item 18) for the five years preceding the estimation. Expected earnings ($E(\upsilon)$), are computed as $E(\upsilon_t) = \upsilon_{t-1} * (1 + \delta)$, where δ is the earnings growth rate. Earnings surprise is the absolute value of the difference between actual and expected earnings scaled by expected earnings. Earnings surprise is standardized by BBL SIC to mean 0, variance 1.

To assess whether earnings surprise varies systematically across sensitivities conditional on use of abnormal accruals to manage earnings, I select the one-third of the sample with highest abnormal accruals to reduce the likelihood that the smoothness of the series is transaction-based. Prior to testing for smoothing I first examine the distribution of abnormal accruals across sensitivities for this sub-sample. To do so, I divide the observations into terciles based on sensitivity value and calculate mean abnormal accruals. The first two columns in Panel A of Table 6 document the means for the standardized positive and negative abnormal accruals, respectively. The high total and high stock-based wealth sensitivity groups have significantly larger mean positive abnormal accruals than the respective low sensitivity groups. High stock-based wealth sensitivity is also associated with larger magnitudes of negative abnormal accruals.

Patterns of abnormal accruals across option-based wealth sensitivities vary from those for total and stock-based wealth sensitivities. Abnormal accrual magnitudes decrease in option-based wealth sensitivity and the negative abnormal accruals magnitudes are significantly smaller at high sensitivities than at low sensitivities. Furthermore, mean positive and negative abnormal accrual magnitudes are considerably

smaller for high option-based wealth sensitivities than for high stock-based wealth sensitivities.

Turning to my variable of interest, I examine mean earnings surprise by wealth sensitivity. Earnings surprise decreases in total and stock-based wealth sensitivities but not option-based wealth sensitivity. I confirm this result by carrying out three univariate regressions of standardized absolute earnings surprise on total, stock-based and option-based wealth sensitivities. The coefficients on the sensitivity measures should be negative if earnings surprise decreases in wealth sensitivity. The results of the univariate regressions, summarized in Panel B of Table 6, show that earnings surprise decreases in total and stock sensitivities but there is no evidence of a significant relation with option-based wealth sensitivity. Taken as a whole, these findings show that, conditional on large accrual magnitudes income-smoothing increases in stock-based wealth sensitivity but option-based wealth sensitivity does not appear to motivate smoothing.

4.2.3.2 Time series test of smoothing

The second test for smoothing examines the variability of the residuals from firm-specific time-series regressions of net income on time. The test assumes that over relatively short horizons, in this case 5 years, earnings follow a trend process with mean reversion.[11,12] The regression in equation (8) is estimated by firm for the one-third of the sample firms with the highest average magnitudes of abnormal accruals over the period 1997-2000.[13]

$$Net\ Income_t = \alpha_0 + \alpha_1 t + \varepsilon_t \qquad (8)$$

[11] Thomas and Zhang (2002) calculate 12 year earnings volatilities using both trend and seasonal random walk models; they find the measures perform the same in their tests and are highly correlated (=0.834).
[12] While it is well documented that earnings follow a seasonal random walk over long horizons, it is unlikely that deliberate smoothing would result in a seasonal random walk over short horizons.
[13] Since my primary tests evaluate wealth sensitivity as an incentive for earnings management, the abnormal accruals are estimated for the fiscal period subsequent to the sensitivity measurement; sensitivity measures are computed for the period 1996-1999, abnormal accruals are estimated for 1997-2000.

where *Net Income* is net income before extraordinary items and discontinued operations (Compustat data item 18), and *t* is time which ranges from 1 for fiscal 1996 to 5 for fiscal 2000. I use net income before extraordinary items because analysts and the financial press focus on this measure; thus, it is more likely to be the objective of smoothing than net income after extraordinary items. I include the additional period to provide five data points for each regression and use only firms whose CEOs do not change during the four year period 1996-1999.

I compare the average of the firm-specific coefficients of variation from regressions using equation (8) across sensitivity ranks. Total, stock and option-based wealth sensitivity ranks for the high abnormal accrual sub-sample are based on average sensitivity values over the period 1996-1999. The coefficient of variation is calculated by dividing the root mean square error from each firm's time-series regression by the firm's mean net income and then multiplying this value by one hundred. The results shown in Panel C of Table 6 show the variance in the regression residuals declines with total and stock-based wealth sensitivity, corroborating the cross-sectional findings that smoothness of earnings is positively related to total and stock sensitivities.

In combination, these findings are consistent with high stock-based, but not option-based, wealth sensitivity motivating managers to reduce risk through income smoothing.

4.2.5 Additional Tests

As a robustness check to ensure my results are not driven by one or two periods I perform annual regressions using equation (5). The average of the annual coefficients from the regressions is examined. The p-values are generally higher than for the pooled sample, and they are less than 0.10 for the total and stock-based wealth sensitivity

coefficients.[14] In addition, because I introduce potential selection bias by separately testing positive and negative abnormal accruals I repeat my tests using a Tobit model to analyze the relation between abnormal accruals and wealth sensitivity. Results are qualitatively similar to those found using OLS.

I also decompose governance into its component measures and repeat my tests using each separate measure in lieu of the proxy created using principal components analysis. I find none of the individual measures results in significant interaction effects, and all the compensation variables except for G score are negatively associated with positive abnormal accruals.

Finally, prior research suggests that CEOs nearing retirement may manage earnings. Specifically, Murphy and Zimmerman (1993) predict but find no evidence that CEOs inflate earnings in their final year to increase payouts under bonus plans. Reitenga and Tearney (2003) investigate earnings management by CEOs for four years prior to manadatory retirements. They find evidence of earnings management in the last two years of the CEOs term and further find that the earnings management was influenced by governance characteristics. Because wealth sensitivity is correlated with executive tenure, I investigate whether horizon-related effects drive my results. I divide the sample CEOs into three groups based on age. The first group is comprised of CEOs aged 65 and older (N=173 executive-years), the second group is CEOs who are 63 or 64 (N=122 executive-years), and the CEOs under 63 form the final group (N=1366 executive-years). I repeat the regressions specified in Equation (7) for each group. My results (untabulated) show that the smoothing behavior associated with stock-based wealth sensitivity is limited to the two younger groups of CEOs, the coefficients on *Stock Sensitivity* for the two groups are similar in magnitude, and that the income-increasing accruals associated with

[14] Significance is determined using t statistics based on the distribution of standard errors for the annual coefficients.

unvested option-based wealth sensitivity is limited to the group consisting of CEOs under the age of 63. While these findings suggest executive horizon is not a key determinant of the observed earnings management, the low numbers of CEOs in the two older groups limit the power of my tests.

Chapter 5: Empirical Investigation of Insider Trading as an Incentive for Earnings Management

This chapter presents the research design and findings for hypotheses 2a, 2b, 3a, and 3b which predict specific relations between executive equity transactions and earnings management, and the expected influence of corporate governance quality on those relations.

H2a: Income-increasing earnings management is used prior to or following executive stock sales.

H2b: Use of income-increasing management around stock sales declines in strength of corporate governance.

H3a: Income-decreasing earnings management is used prior to option grants and stock purchases.

H3b: Use of income-decreasing management preceding option grants and stock purchases declines in strength of corporate governance.

5.1 Sample Selection and Data

Tests of hypotheses 2 and 3 use the same sample CEOs and CFOs and many of the same empirical measures used for tests of hypotheses 1a and 1b. Additional data sources, measures and methodologies are described below.

5.1.1 Measures of Earnings Management

My primary proxy for earnings management is quarterly discretionary current accruals. Because the tests in this section provide an analysis of insider transactions as possible incentives to manage earnings, I use quarterly data from the earnings reports issued proximate to the insider transactions to construct my abnormal accruals measures.

Minimizing the time between abnormal accrual measurement and the executive transactions reduces the opportunity for other factors to influence abnormal accrual levels.

Estimation of the quarterly discretionary accruals parallels the methodology for annual accruals except it uses quarterly data. Change measures used in calculating abnormal accruals using equations (1) and (2) (e.g. change in sales and change in accounts receivable) are computed using the year-to-year change for a given fiscal quarter. Because seasonal and year-end effects influence quarterly measures, the industry-quarter specific parameters are estimated independently for firms with March, June, September and December fiscal year-ends. The number of firms with other fiscal year-ends is too limited to estimate the required parameters. Therefore, 80 firms are dropped from the sample.

5.1.2 Measures of Insider Trade

Insider trading data for the selected CEOs consist of transactions reported on SEC Form 4 obtained from the Thomson Financial Insider database. The sample includes open market trades, selected transactions related to employee benefit plans and dispositions of shares to the issuer. All data used are for transactions in securities classified by Thomson as direct.[15]

I examine insider trading as a potential motivation for earnings management. I am interested in insider sales, purchases and option grants reported over the quarter following the earnings report that includes abnormal accruals, with my quarters extending between the earnings announcement dates reported by Compustat. I also examine abnormal accruals for the six quarter ends following an insider sale in order to evaluate

[15] Thomson defines direct holdings as "equity securities held in the insider's name, or in the name of a broker, bank or nominee on behalf of the insider." Transactions related to employee benefit plans are grants and awards, option exercises, discretionary transactions under purchase plans and payments related to option exercises through delivery of securities.

whether insiders engage in post-sale earnings management to avoid detection of prohibited or questionable insider trading based on propriety knowledge of future earnings.

I use the number of shares underlying each trade or grant as the basis for my executive-specific insider trading measures. Shares traded are cumulated by transaction type for each quarter. In order to capture the relative importance of a transaction to an executive, I scale the number of shares transacted by the number of shares held.[16] Finally, I standardize the measure by industry-quarter to control for industry- and time-specific effects.[17]

I am interested in abnormal accruals reported in the periods preceding grants, purchases and sales, as well as the six quarters subsequent to a sale. In order to isolate the specific relations of interest, my univariate tests use executive-quarters where only one type of event is recorded. For example, if a stock sale occurs in one of the six quarters immediately following another sale, or if a grant occurs in the same period as a sale the observation is dropped. Consequently, approximately forty-four percent of the CEO transactions and thirty-three percent of the CFO transactions are dropped leaving 4085 CEO quarters and 3399 CFO quarters with unique events. Furthermore, while the findings of Ke, Huddart and Petroni (2002, KHP) suggest the distance between insider sales and unfavorable news may extend for up to 9 quarters, the sample of executives without conflicting transactions in post-sale periods beyond 6 quarters becomes too small to effectively test. The final sample includes 380 (329) unique CEOs (CEO firms) and 264 (243) unique CFOs (CFO firms).

[16] Grants are scaled by the sum of shares owned and options held due to the number of grant receiving executives who have minimal stock holdings.

[17] An example of an industry effect would be use of options as a substitute for cash compensation by firms in growth industries. Time effects might arise when stock sales follow increases in value following market run-ups.

5.1.3 Descriptive Statistics

Descriptive statistics for the executive transactions appear in Table 7. Panel A provides statistics that are conditional on the reported transactions taking place, such that the average shares underlying option grants represent averages for executive-quarters where option grants are reported. Consistent with the compensation distributions the mean values are dominated by large transactions. On average, CEOs receive approximately three times the number of options as CFOs and buy and sell more shares of stock than the CFOs.

Panel B reveals there are no transactions in nearly one-half of the executive-quarters, that the most frequent transaction is option grants, followed by stock sales for both CEOs and CFOs. The balance between grants and sales is consistent with Ofek and Yermack (2000) who document near total selling of shares acquired through option exercises by CEOs. While transactions only occur in approximately one-half of the executive-quarters, very few of the sample executives report no transactions.

5.2 UNIVARIATE RELATIONS

In this section I evaluate three hypotheses related to earnings management surrounding insider transactions. First, I assess whether the sample executives engage in income-decreasing accrual manipulations preceding option grants or stock purchases. Second, I empirically examine two hypotheses on the timing of income-increasing earnings management relative to insider sales. Finally, I determine whether governance quality affects transaction-related earnings management.

Table 8 provides a description of the distributions of abnormal accruals by transaction type. The first row of Panel A presents statistics for CEO quarters where no transactions are reported and no sales have occurred in the six previous quarters which serve as the control against which transaction-related abnormal accruals are compared.

As can be seen from the second column of the table, the vast majority of firms are included in the control population, and each transaction type contains a fairly broad representation of firms relative to the number of observations documented.

Hypothesis 2 predicts that executives use negative abnormal accruals to depress earnings prior to option grants and stock purchases. While the sign for mean abnormal accruals for the period prior to option grants is negative, it is not significantly different from either zero or the control sample mean. I do however find that abnormal accruals for the earnings report immediately preceding CEO stock purchases are on average negative and significantly less than the control abnormal accruals. In addition, the frequency of positive abnormal accruals for purchasing CEOs is significantly less than the 53.2% observed for the control group indicating the frequency of negative accruals is higher than normal for the earnings reports preceding CEO stock purchases.

Turning to CEO stock sales, I find no difference between abnormal accruals for sale and control groups preceding the sale but do find evidence consistent with post-sale income-increasing earnings management in each of the three quarters following the sale. My results suggest that positive abnormal accruals are used following but not preceding insider stock sales consistent with the findings of Beneish, Press and Vargus (2004, BPV) for a sample of firms with subsequent debt covenant defaults. While mean abnormal accruals remain positive over the fourth through sixth quarters following the sale, the excess over the control is not significant for these periods.

CFO findings generally parallel those for CEOs except for stock purchases. Abnormal accruals are significantly positive and greater than the control value prior to CFO stock acquisitions. These results are not consistent with predictions but suggest the CFOs may use earnings management to signal their private information about positive firm prospects.

Although my results appear generally consistent with BPV, they differ in several respects with studies by Ke, Huddart and Petroni (2003, KHP), and Bartov and Mohanram (2004, BM). In particular, KHP find that insider stock sales precede unfavorable earnings news by as many as nine quarters. If earnings management is employed post-trade to distance the insider sale from the bad news, KHP's results suggest the abnormal accruals should remain positive through at least six quarters; however, I find they are only significantly positive for the first three quarters following the sale.

BM show that large insider option exercises are preceded by abnormally positive earnings and followed by poor earnings performance. They conclude that executives opportunistically manage pre-exercise earnings to increase cash payouts, but that reversals of the pre-exercise overstatements negatively affect the post-exercise period.[18] BM focus exclusively on large transactions, reasoning that the incentives for private information-based wealth exercise are greatest for them. Accordingly, I partition my samples into three equal groups based on transaction size to see if the results vary by size. The transaction measures used for size classification are the shares transacted scaled by shares owned, standardized for each executive type by BBL SIC code. Size group assignment for the post-sale periods is based on the ranking for the period when the sale occurred rather than the respective post-sale period.

Abnormal accruals by transaction size are summarized in Table 9 and illustrated in Figures 2 and 3. Consistent with the full sample results, pre-grant abnormal accruals for CEOs are not significantly negative for any grant size grouping. Breakdown of stock purchases by size reveals negative abnormal accruals precede medium and large purchases by CEOs, consistent with larger transactions providing stronger earnings

[18] BM assume that all stock acquired through insider option exercises is immediately sold.

management incentives. Pre-purchase deflation of earnings may in part explain Seyhun's (1998) findings that stock prices increase over the year following insider purchases.

The decomposition of CEO sales into size terciles reveals that the positive post-sale abnormal accruals are concentrated in periods following large transactions. In particular abnormal accruals are significantly positive for all six quarters following sales that are in the upper third of the sale transaction size distribution. Figure 3 reveals that abnormal accrual magnitudes increase in time from sale for large and, to a lesser extent, medium sales. Such growth in abnormal accruals is consistent with a build up of accruals over time to mask the negative effects of accrual reversals on earnings performance and distance the sale from unfavorable earnings news. These findings conflict with BM who document negative abnormal accruals in the year following large option exercises. Furthermore, poor earnings performance in the period immediately following significant insider transactions, as documented in BM, would likely invite regulatory scrutiny resulting in substantial risk of discovery of the earnings management. My results are more consistent with the protracted time interval between insider sales and disappointing earnings news documented by KHP.

Breakdown of CFO transactions into size groupings provides few insights over the aggregate results. Abnormal accruals are negative preceding grants to CFOs when the grants are small relative to total CFO holdings and are significantly more negative than the control ($t = 1.42$, $p=0.10$). However, there is no evidence of manipulation prior to larger grants.

The positive pre-purchase abnormal accruals observed for the CFOs appear to be concentrated in the large group, although mean values are positive across all transaction sizes. Examination of Figure 3 reveals that post-sale abnormal accruals related to large sales by CFOs present a pattern similar to those for large sales by CEOs; Table 9 reveals

they are only significantly different from control levels in the third through sixth post-sale quarters. However, the sample sizes for CFOs are small and the lack of significance may reflect low power.

5.3 REGRESSION ANALYSIS

While the univariate results suggest that large insider transactions serve as incentives to opportunistically manage earnings, they might also reflect systematic variance of the equity transactions with firm characteristics such as growth, volatility and leverage that are associated with abnormal accruals. I investigate this possibility through use of regression analysis that controls for factors likely to be associated with both abnormal accruals and equity transactions. These are the same control variables used in the sensitivity regressions and are described in section 4.1.4; however, the financial variables are constructed using quarterly data. As before, control variables are standardized to a mean of zero and variance of one by BBL SIC code and fiscal period to control for industry and time effects.

The dependent variable for the regressions is abnormal accruals (*EM*) constructed using the variation of the cross-sectional modified Jones model described in section 4.1.1. Because the abnormal accruals for these tests are not separated by sign, standardization to provide support for the dependent variable is no longer necessary. The abnormal accrual measurement employs time and industry specific parameters, controlling for related effects.

The regressions use the full sample including the periods in which transactions of multiple types are reported. In light of the non-linearity of the relation between abnormal accruals and transaction size, I employ a specification using transaction indicator variables. The indicator variables are turned on for observations whose standardized, scaled trade sizes fall in the upper one-third of the size distribution for each transaction

type. In addition, since the hypotheses predict that the earnings management motivated by option grants and stock purchases is the reverse of the earnings management related to stock sales, I include interaction terms between each of the sales variables and an indicator variable set equal to one in periods when either a grant or purchase is reported. The specification for the regression is given by equation (9):

$$EM_{it+1} = \alpha_0 + \alpha_1 Grant_{it} + \alpha_2 Purchase_{it} + \alpha_3 Sale_{it} + \sum_{j=1}^{6} \alpha_{j+3} Sale_{it-j} + \sum_{j=1}^{6} \alpha_{j+9} Sale_{it-j} * Buy_{it} + \alpha_{16} Size_{it} + \alpha_{17} ROA_{it} + \alpha_{18} MTB_{it} + \alpha_{19} DTA_{it} + \alpha_{20} StockVolatility_{it} + \varepsilon_{it} \quad (9)$$

where EM_{it+1} = represents abnormal accruals for the quarter preceding the grant, purchase or sale transaction

$Grant_{it}$ = 1 if an option grant is reported by the executive of firm *i* in quarter *t*

$Purchase_{it}$ = 1 if a stock purchase is reported by the executive of firm *i* in quarter *t*

$Sale_{it-0...6}$ = 1 if a stock sale is reported by the executive of firm *i* in quarter *t*

Buy_{it} = 1 if either an option grant or stock purchase is reported by the executive of firm *i* in quarter *t*

Because the abnormal accruals variable is not standardized the coefficients on the transaction variables represent the amount of abnormal accruals, expressed as a fraction of total assets, associated with the respective equity transaction. According to hypotheses two and three, I expect the coefficients on *Grant* and *Purchase* to be negative and the coefficients on the seven *Sale* variables to be positive. The signs on the interaction terms could be positive or negative depending on whether sale or purchase earnings management incentives dominate, so I make no predictions regarding them.

The first column under the heading Equation (9) in Table 10 reports the results of the regression for CEOs. The intercept term equals the mean abnormal accruals for the

control group. The coefficients on the test variables represent the amount by which abnormal accruals differ from the control level. Consistent with the univariate results and prediction, the coefficient on *Purchase* is significantly negative. The coefficient value of -0.0070 indicates abnormal accruals for CEOs making large stock purchases are lower than the mean control abnormal accruals of 0.07% of assets by 0.70% of assets. Thus, negative abnormal accruals for the purchasing executives average 0.63% of assets (0.07% minus 0.70%), confirming that the sample CEOs appear to take income-decreasing actions prior to large stock purchases.

I again find no evidence of accrual management prior to large option grants to CEOs. However, in contrast to the univariate results, the coefficient on sale is significantly negative after controlling for profitability, growth, leverage and risk suggesting that reported earnings are managed down in anticipation of large insider sales. One possible explanation is that executives both reserve income and sell shares in high profit periods in anticipation of weak future performance. Alternatively, the executive may use negative abnormal accruals to communicate private information about future performance. The positive abnormal accrual effect in the first period subsequent to the sale is of nearly equal magnitude to the negative effect observed in the sale period, consistent with reversal of reserves established in the period of sale to avoid a post-sale earnings decline. Abnormal accruals follow an increasing trend over each of the next five quarters but are statistically significant only from the fourth quarter on. This pattern is consistent with that illustrated in Figure 3, again suggesting possible accrual management to distance unfavorable news from insider sales accompanied by a build-up of accruals as time passes.

The regression results for CFOs appear in the second column of Table 10. The findings differ from the univariate results in several respects. First, the coefficient on grants is significantly negative implying average negative abnormal accruals equal to 0.34% (i.e. the coefficient of -0.0046 less the intercept 0.0012) of assets in quarters when CFOs receive large grants of stock options. Second, CFO stock purchases are no longer associated with positive abnormal accruals. Finally, abnormal accrual usage is not significant for any post-sale period.

Although the magnitudes of the regressions coefficients are small, the inferred accruals could have a pivotal effect on achieving earnings targets. Consider the 0.0038 value for the coefficient for the first quarter following a CEO sale. For a $1 billion asset firm with 65 million shares outstanding (the mean number of shares outstanding for sample firms with $1 to $1.5 billion in assets) this translates into $3.1 million [(0.0038-0.0007)*1 billion] in above average accruals which could impact earnings by as much as 4.8 cents per share.

In order to assess whether strong governance inhibits transaction driven accrual manipulations, I expand equation (9) to include *Governance Score* and interaction terms between *Governance Score* (represented by *G* in the interaction terms*)* and the various transaction dummy variables, as depicted in equation (10).

$$EM_{it+1} = \alpha_0 + \alpha_1 Grant_{it} + \alpha_2 Grant_{it} * G_{it} + \alpha_3 Purchase_{it} + \alpha_4 Purchase_{it} * G_{it} + \alpha_5 Sale_{it} + \alpha_6 Sale_{it} * G_{it} + \sum_{j=1}^{6} \alpha_{j+6} Sale_{it-j} + \sum_{j=1}^{6} \alpha_{j+12} Sale_{it-j} * G_{it} + \alpha_{19} Governance\ Score_{it} + \sum_{j=1}^{6} \alpha_{j+19} Sale_{it-j} * Buy_{it} + \alpha_{26} Size_{it} + \alpha_{27} ROA_{it} + \alpha_{28} MTB_{it} + \alpha_{29} DTA_{it} + \alpha_{30} StockVolatility_{it} + \varepsilon_{it} \quad (10)$$

As in the sensitivity regressions, I find that governance quality is negatively

related to abnormal accruals but does not appear to significantly influence the use of abnormal accruals surrounding insider trades.

In total my findings indicate that CEOs sell shares in expectation of poor earnings performance and use income-increasing earnings management to distance their transactions from the disappointing news; CEOs use income-decreasing earnings management preceding large equity purchases; income-decreasing accruals precede CFO option grants; and corporate governance does not influence the use of transaction-related accrual manipulations.

Chapter 6: Summary and Conclusions

This paper investigates whether executive wealth sensitivity to stock price fluctuations or executive equity transactions serve as incentives for earnings management. I find that increasing wealth sensitivity, most notably the sensitivity arising from stock holdings, is associated with CEO abnormal accrual usage. Further, the relation between abnormal accruals and stock-based wealth sensitivity is consistent with income-smoothing earnings management. Since smooth earnings are associated with higher stock valuations (Thomas and Zhang 2002; Allayannis and Weston 2003) my findings suggest that wealth exposure arising from stock ownership is effective in aligning the interests of CEOs and shareholders.

I also analyze whether governance quality influences the wealth sensitivity-abnormal accrual relation. While strong governance is associated with lower overall levels of abnormal accruals, governance does not significantly influence the association between CEO stock-based wealth sensitivity and earnings smoothing. The failure of governance to curb earnings management supports the proposition that income smoothing is an expected outcome of efficient contracting consistent with incentive alignment. These results complement Heflin, Kwon and Wild (2002) who also find earnings smoothing is associated with strong governance. They reason that stewardship over corporate assets involves maximizing returns for shareholders which managers accomplish in part through accrual adjustments.

I also examine whether executives manage earnings in order to maximize the value of their stock transactions. In the absence of insider stock transactions all shareholders share the costs and benefits of earnings management. However, if executives opportunistically trade based on proprietary knowledge about the distribution

of unmanaged earnings, there is a potential redistribution of wealth from outside shareholders to executives. My findings suggest managers behave opportunistically. Specifically, I find an increase in income-decreasing accruals preceding large stock purchases by CEOs as well as an increase in income-increasing accruals following, but not preceding, large stock sales by CEOs; both suggest trading on private information. These results extend those of Ke, Huddart and Petroni (2003, KHP) and Beneish, Press and Vargus (2004). KHP find that insider sales precede breaks in earnings strings by up to nine quarters consistent with trading based on foreknowledge of disappointing earnings news. My results indicate the revelation of the bad news may be deliberately distanced from the sale through accrual manipulations. My results also agree with BPV's findings for a sample of firms that subsequently experience a technical default, that insiders use income-increasing earnings management following sales but not preceding sales; they further indicate the BPV results extend to a more general population of firms.

I also document that governance does not materially alter CEO use of abnormal accruals around transactions despite the manifest evidence of opportunism. My ability to document trade related earnings management, but not a governance effect on the relation, suggests that opportunistic trade is an expected outcome of contracting that, despite wealth transfers to the executive, may be beneficial to shareholders. My results are consistent with Roulstone's (2000) findings that firms that restrict insider trading pay a significant premium in total compensation and with Dye's (1984) model that demonstrates that, under certain circumstances, both managers and owners achieve higher utility when managers are allowed to trade on inside information.

This study has several important limitations. First, I assume that the accruals models provide accurate measures of abnormal accruals. While variations on the Jones model have been used extensively to estimate discretionary accruals, several recent

studies question the reliability of the model (Kang and Sivaramakrishnan 1995; Kothari, Leone and Wasley 2002). While my results are robust to three different abnormal accruals models, all rely on similar assumptions to partition accruals into nondiscretionary and discretionary components so that measurement error may span all the models. Second, my option-based wealth sensitivity measures are based on Black Scholes option pricing. A number of the assumptions underlying Black Scholes do not hold for executive options, most importantly the assumption of risk neutrality. Finally, governance is a complex system of interrelated factors. Factors that influence the examined relations may not be effectively captured by my governance measures.

Nonetheless, this study provides useful evidence about the effectiveness of stock-based wealth compensation in efficient contracting and raises some interesting questions for future research. In particular, my results show that significant stock ownership leads to earnings management consistent with long-term incentive alignment; however, I observe wide cross-sectional variation in stock-based wealth sensitivity suggesting compensation is not uniformly designed to motivate CEOs to maximize long-term value. I also document evidence of opportunistic behavior around equity transactions. Furthermore, although opportunistic earnings management does not appear to be in shareholders' best interests, governance controls do not serve as deterrents.

Figure 1

Relation Between Total Wealth Sensitivity and Abnormal Accruals

This figure depicts the relation between total sensitivity of executive wealth to stock price change and abnormal accrual magnitudes. The scale for total sensitivity is the within sample rank with 1 (15) representing the lowest (highest) sensitivity group. Abnormal accruals are standardized by BBL SIC to a mean of zero. Positive (negative) abnormal accruals with values greater (less) than zero have magnitudes greater than the industry mean.

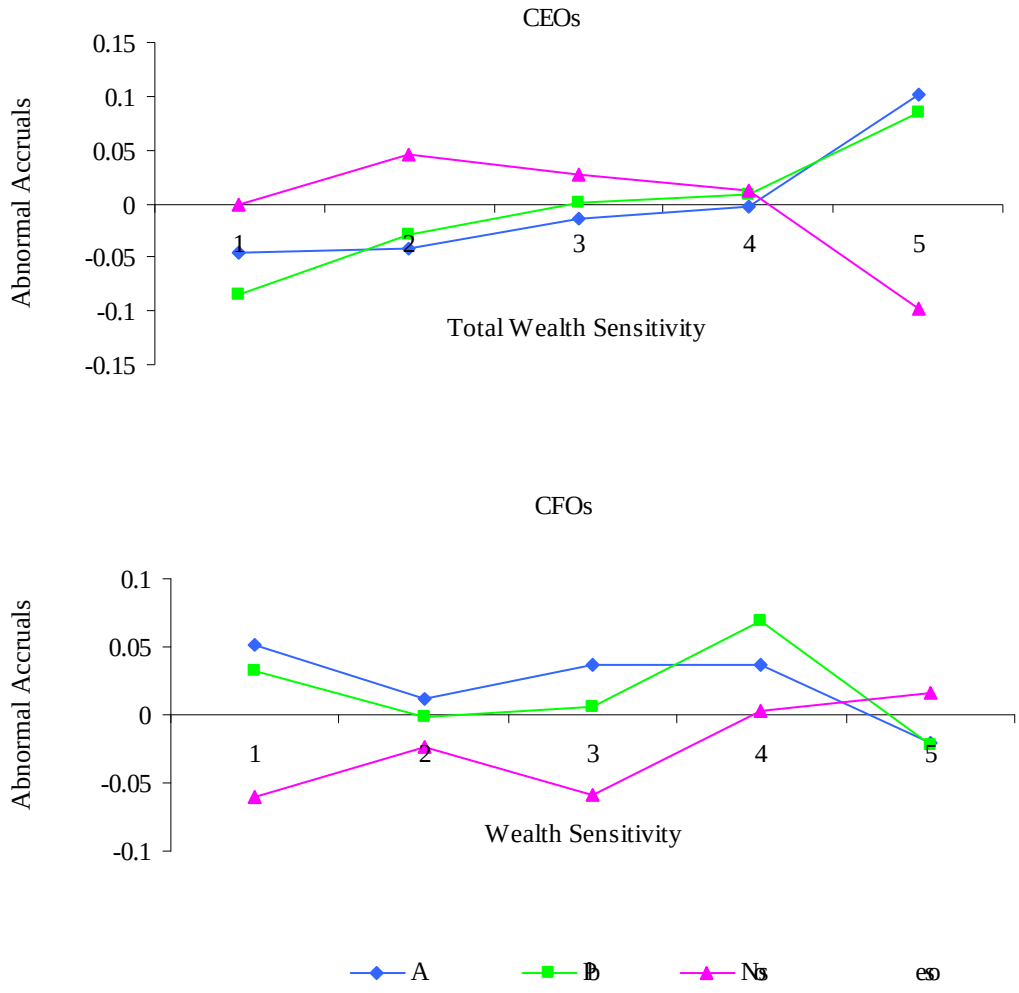

Figure 2

Mean Abnormal Accruals Preceding Option Grants and Stock Purchases

This figure shows the mean abnormal accruals for the quarter-end preceding stock option grants and stock purchases for sample CEOs and CFOs receiving grants or making purchases. Grant size is calculated as the proportion of shares underlying the grant to the sum of shares and options owned prior to the grant, standardized for each executive type by industry. Purchase size is equal to the shares purchased scaled by the shares owned prior to the purchase. Transaction sizes are standardized by industry and executive type. Small, medium and large grants (purchases) are those that fall within the lowest, middle and highest thirds of the sample distribution, respectively, for each executive type. Controls are the mean abnormal accruals for quarters where no transactions are reported and no sales are reported in the prior six quarters.

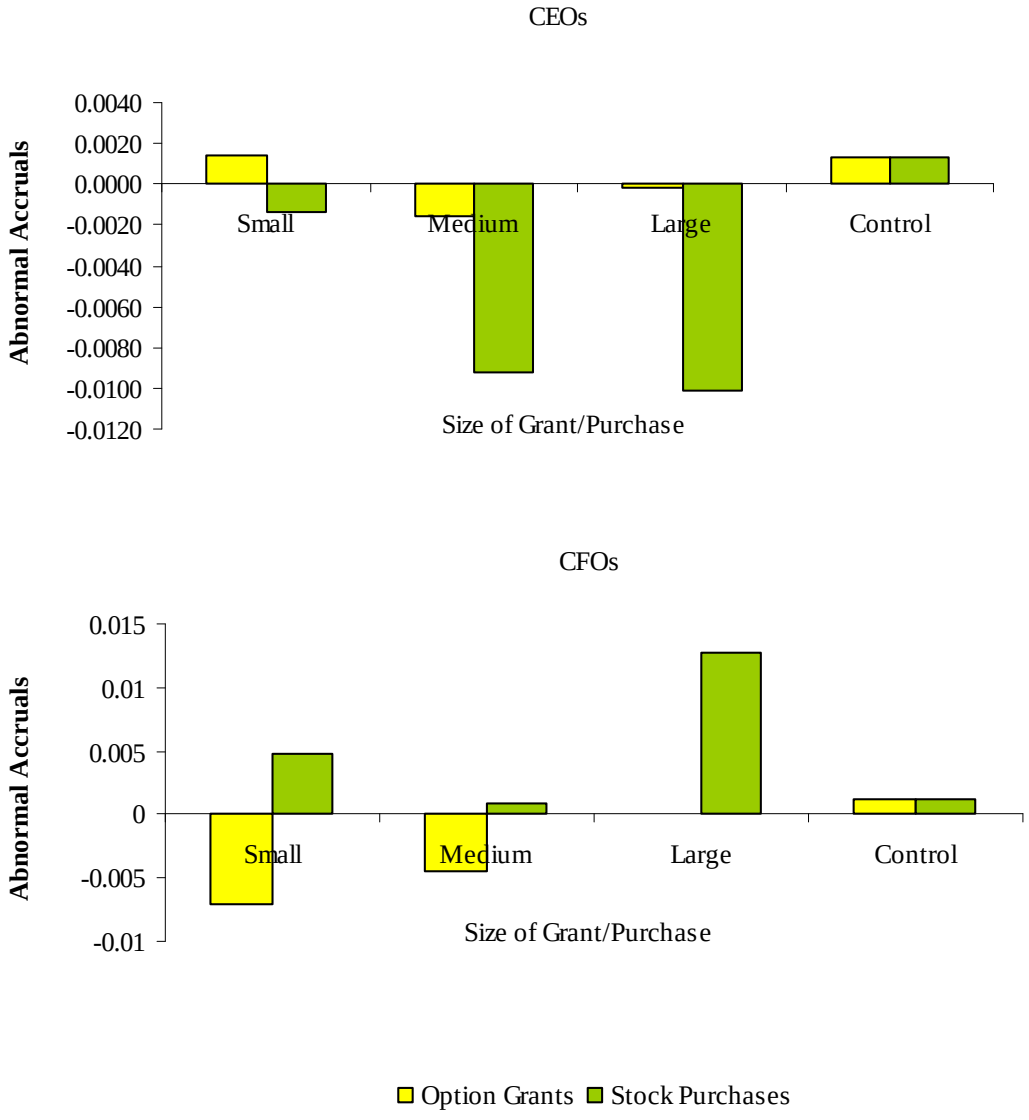

Figure 3

Mean Abnormal Accruals by Transaction Size Proximal to CEO and CFO Stock Sales

This figure portrays the mean abnormal accruals for the quarter-end preceding stock sales (0), and each of the six quarter-ends following a stock sale (+1 through +6). Size of sale is measured as the proportion of shares sold to shares owned prior to the sale, standardized for each executive type by industry. Small, medium and large sales are those that fall within the lowest, middle and highest thirds of the sample distribution, respectively, for each executive type. Controls are the mean abnormal accruals for quarters where no transactions are reported and no sales are reported in the prior six quarters.

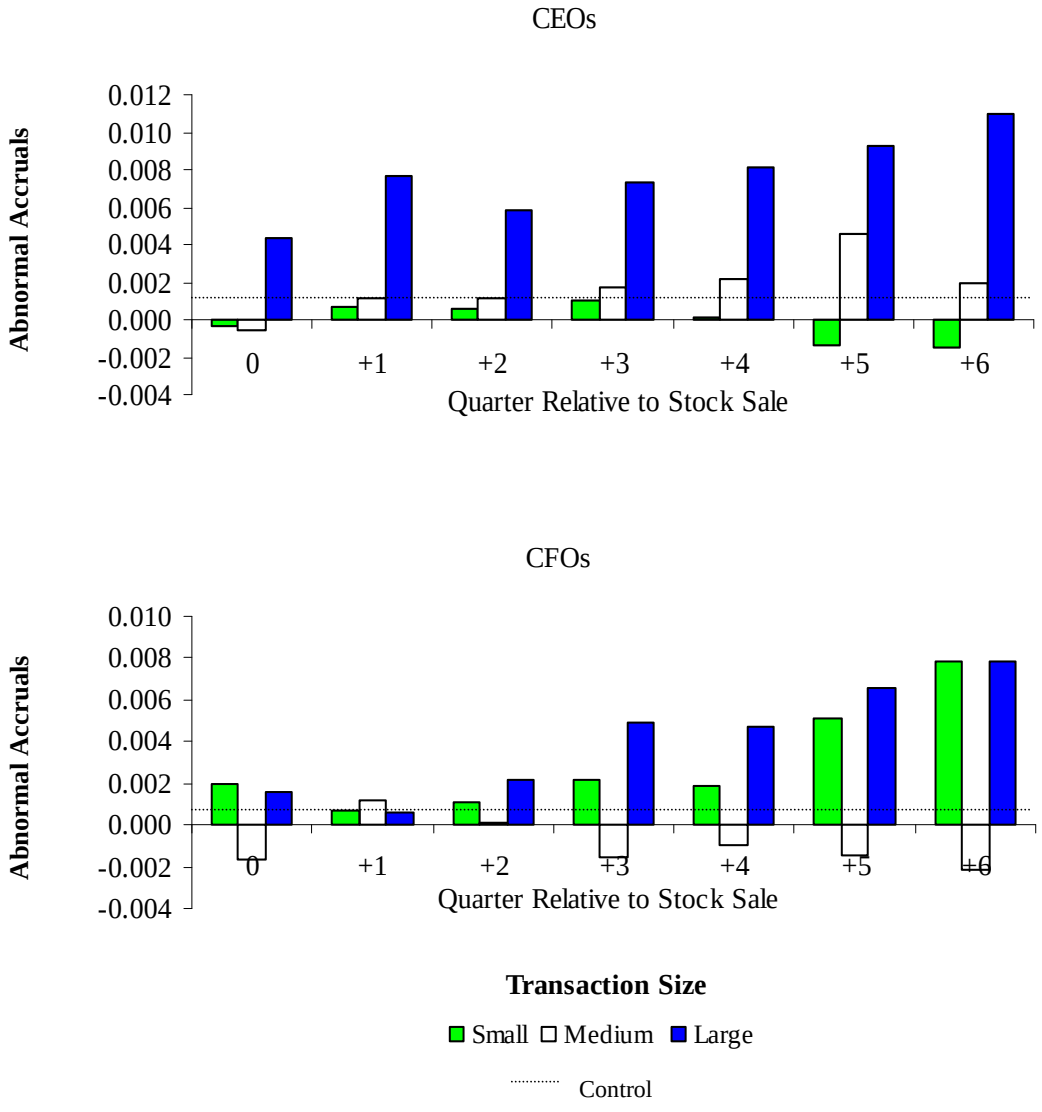

Table 1
Principal Components of Governance Score

Governance score is constructed as the linear combination of the products of the factor loadings and the variable values for each observation using the factor loadings for the first principal component obtained using principal component analysis of the five governance variables. Directors is the number of directors on the firms' board. Outside represents the fraction of the board members that are not current or former employees, their relatives, or consultants or attorneys employed by the firm. Meetings is the number of meetings held during the year. Institution equals the percentage of shares of the firm held by institutional investors. G score is a measure of shareholder rights constructed by Gompers, Ishii and Metrick (2003). Pair-wise correlations among the five variables, the factor loadings, and the variance explained by the first principal component are summarized. The principal component analysis is carried out separately for each BBL SIC code to provide an industry-specific composite measure of governance.

		Pearson Correlations					Factor	Variance
SIC Code		Directors	Outside	Meetings	Institution	G score	Loading	Explained
	Directors	1	0.23	0.48**	0.32	0.41**	0.70	
	Outside		1	0.11	-0.28	-0.15	0.07	
1	Meetings			1	-0.24	0.05	0.41	35%
	Institution				1	0.22	0.30	
	G score					1	0.50	
	Directors	1	0.43***	0.14	0.28*	-0.02	0.52	
	Outside		1	0.10	0.10	-0.20	0.43	
2	Meetings			1	0.51***	-0.03	0.49	36%
	Institution				1	0.05	0.54	
	G score					1	-0.11	
	Directors	1	0.03	-0.009	-0.23***	0.18**	0.02	
	Outside		1	0.46***	0.24***	0.38***	0.60	
3	Meetings			1	0.20**	0.27***	0.55	37%
	Institution				1	0.06	0.32	
	G score					1	0.47	
	Directors	1	-0.10	0.08	0.12	0.10	0.26	
	Outside		1	0.06	0.19*	0.11	0.41	
4	Meetings			1	0.00	0.08	0.23	28%
	Institution				1	0.24**	0.61	
	G score					1	0.58	
	Directors	1	0.18	0.54***	0.11	0.42***	0.57	
	Outside		1	0.26*	-0.21	0.10	0.26	
5	Meetings			1	0.26*	0.39***	0.59	41%
	Institution				1	-0.01	0.15	
	G score					1	0.48	
	Directors	1	-0.08	0.21	0.27**	-0.13	0.59	
	Outside		1	0.23*	-0.07	-0.12	0.15	
6	Meetings			1	-0.07	-0.10	0.38	30%
	Institution				1	-0.19	0.49	
	G score					1	-0.50	

Table 1, continued

SIC Code		Pearson Correlations					Factor Loading	Variance Explained
		Directors	Outside	Meetings	Institution	G score		
	Directors	1	0.35***	0.14**	0.16***	0.32***	0.53	
	Outside		1	0.14**	0.08	0.35***	0.53	
7	Meetings			1	0.09	0.10*	0.28	36%
	Institution				1	0.15***	0.29	
	G score					1	0.52	
	Directors	1	0.15*	0.11	0.01	0.33***	0.72	
	Outside		1	0.07	0.18**	-0.07	0.31	
8	Meetings			1	0.09	-0.07	0.18	27%
	Institution				1	-0.01	0.17	
	G score					1	0.57	
	Directors	1	0.31**	0.55***	0.01	0.14	0.44	
	Outside		1	0.28**	0.18	0.62***	0.53	
9	Meetings			1	0.02	0.35***	0.50	43%
	Institution				1	0.07	0.13	
	G score					1	0.50	
	Directors	1	0.28***	0.21***	-0.03	0.07	0.39	
	Outside		1	0.16**	0.11	0.15**	0.47	
10	Meetings			1	0.18**	0.18**	0.49	33%
	Institution				1	0.29***	0.41	
	G score					1	0.47	
	Directors	1	0.88***	0.04	0.52***	-0.1	0.54	
	Outside		1	0.16	0.63***	-0.07	0.38	
11	Meetings			1	0.35**	-0.09	-0.07	50%
	Institution				1	-0.35**	-0.39	
	G score					1	0.63	

*,**,*** denote significance at p=0.10,0.05,0.10, respectively

Table 2
Descriptive Statistics

This table presents summary statistics for the sample firms, the CEOs and the CFOs. Panel A provides the distribution of the 410 sample firms by industry. Panel B shows the firm financial and governance characteristics over the 1996-1999 time period. Panel C summarizes the compensation and wealth variables for the sample CEOs and CFOs. All variables are defined in Appendix B.

Panel A **Distribution of Sample Firms by Industry**

Industry Code[1]	Industry Description	SIC Codes Included	Sample Firms	Percent
1	Mining and construction	1000-1299, 1400-1999	10	2.40%
2	Food	2000-2111	15	3.70%
3	Textiles, printing and publishing	2200-2799	54	13.20%
4	Chemicals	2800-2824, 2840-2899	25	6.10%
5	Pharmaceuticals	2830-2836	25	6.10%
6	Extractive industries	2900-2999, 1300-1399	20	4.90%
7	Durable manufacturers	3000-3569, 3580-3669, 3680-3999	115	28.00%
8	Computers	7370-7379, 3570-3579, 3670-3679	48	11.70%
9	Transportation	4000-4899	21	5.10%
10	Retail	5000-5999	65	15.90%
11	Services	7000-7369, 7380-8999	12	2.90%
	Total		410	100.00%

Panel B **Firm Characteristics**

(dollar amounts in millions)	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
Financial Variables					
N=1,661 firm years except as noted					
Total assets	$5,231.99	$11,127.30	$659.48	$1,492.20	$4,813.96
Sales	$5,703.58	$14,643.18	$670.31	$1,732.17	$4,969.40
Market value of equity	$10,605.68	$33,388.57	$623.52	$1,926.61	$5,952.34
Market to book	4.33	16.82	1.72	2.68	4.54
Return on assets	6.50%	12.80%	3.10%	7.20%	10.90%
Debt to assets	0.55	0.21	0.43	0.55	0.67
Stock volatility	0.18	0.09	0.11	0.17	0.26
Abnormal accruals	0.12%	5.86%	-2.60%	-0.08%	2.66%
Positive abnormal accruals[2] (N=851)	4.32%	4.39%	1.29%	2.73%	6.02%
Negative abnormal accruals[2] (N=810)	-3.88%	4.00%	-4.98%	-2.52%	-1.24%
Governance Variables					
Outside directors as a percent of total	75%	13%	67%	78%	85%
Number of directors	9.68	2.82	8	9	11
Number of meetings	7.25	2.79	5	7	9
Shares held by institutions	62%	16%	54%	62%	73%
G score (N=1,312)	8.53	3.77	6	9	11

[1] Industry classifications are based on Barth, Beaver and Landsman (1998)

[2] Expressed as a percent of total assets

Table 2, continued

Panel C	**Characteristics of Sample Executives**				
(000s omitted except for age)	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
N=1,661 executive years for 475 CEOs		**CEOs**			
Age	54.59	6.16	51	55	59
Salary	$605.39	$311.34	$391.58	$545.92	$750.00
Bonus*	$609.36	$841.88	$162.64	$400.25	$763.18
Stock (shares)	3,384.55	39,443.04	79.06	260.06	1,078.28
Restricted stock (shares)	60.67	561.75	0	0	21.07
Options (shares)	1,277.25	2,437.89	204.23	489.58	1,219.50
Grants (shares)	247.21	662.18	20	73.05	200
Exercises (shares)	122.41	475	0	0	57.64
Wealth sensitivity*					
Total**	$766.61	$2,098.61	$81.01	$206.44	$630.30
Stock-based	$469.18	$1,877.78	$17.47	$61.26	$199.78
Option-based	$283.26	$665.83	$27.34	$90.39	$252.84
N=1249 executive years for 330 CFOs		**CFOs**			
Salary	$272.53	$120.38	$188.33	$248.75	$343.75
Bonus*	$185.69	$195.08	$49.72	$131.24	$264.82
Stock (shares)	57.76	124.32	7.37	22.46	61.20
Restricted stock (shares)	6.76	22.81	0	0	2.5
Options (shares)	195.41	273.38	60	114	230.999
Grants (shares)	67.19	140.92	10	25	60.074
Exercises (shares)	24.24	61.51	0	0	20.5
Wealth sensitivity*					
Total**	$117.86	$290.81	$17.88	$40.94	$102.61
Stock-based	$23.22	$41.98	$2.09	$8.59	$24.28
Option-based	$94.64	$280.70	$9.34	$26.10	$65.22

*Values are not scaled by salary and bonus

**Total sensitivity includes stock-based, option-based and restricted stock-based wealth sensitivities

Table 3

Correlation Matrix

This table presents correlation matrices for the pooled sample. Pearson correlations for the CEO (CFO) sample are presented above (below) the diagonal, p values appear in italics below the correlations. All variables are defined in Appendix B.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Absolute abnormal accruals	1	0.0878 *0.0103*	-0.1672 *0.0068*	-0.1076 *0.0023*	-0.1423 *<0.0001*	0.1233 *0.0416*	0.0942 *0.0069*	-0.0792 *0.0236*	0.0968 *0.0023*
(2) Total sensitivity	-0.0687 *0.1231*	1	-0.0754 *0.0653*	-0.0020 *0.6051*	0.1991 *<0.0001*	0.2269 *<0.0001*	0.1395 *<0.0001*	-0.1809 *<0.0001*	-0.0078 *0.7475*
(3) Governance	-0.0771 *0.0762*	0.0499 *0.1237*	1	0.2181 *0.0092*	0.3878 *0.0004*	-0.1298 *0.0001*	-0.0083 *0.8830*	0.3296 *0.0062*	-0.0619 *0.0109*
(4) Bonus	-0.8650 *0.0400*	0.0181 *0.5772*	0.0478 *0.1400*	1	0.4311 *<0.0001*	0.0737 *<0.0001*	0.1354 *0.0001*	0.1942 *0.0183*	-0.0772 *0.0015*
(5) Size	-0.1702 *0.0001*	0.3856 *<0.0001*	0.2249 *0.0488*	0.3418 *<0.0001*	1	0.2927 *<0.0001*	0.3656 *<0.0001*	0.0703 *0.0045*	-0.2060 *<0.0001*
(6) Return on assets	0.0377 *0.1829*	0.1779 *<0.0001*	-0.0180 *0.5795*	0.2365 *<0.0001*	0.3421 *<0.0001*	1	0.2522 *<0.0001*	-0.4644 *<0.0001*	-0.0298 *0.2213*
(7) Market to book	0.0655 *0.1226*	0.1676 *<0.0001*	-0.0142 *0.6615*	0.1290 *<0.0001*	0.3556 *<0.0001*	0.3085 *<0.0001*	1	-0.0267 *0.0506*	0.0001 *0.9978*
(8) Debt to assets	-0.0107 *0.8270*	0.0131 *0.6859*	0.0365 *0.2601*	0.0199 *0.5395*	-0.0334 *0.3032*	-0.4846 *<0.0001*	-0.0643 *0.0472*	1	-0.1166 *<0.0001*
(9) Stock volatility	0.0865 *0.0480*	0.0246 *0.4483*	-0.0173 *0.5939*	-0.0468 *0.1487*	-0.2083 *<0.0001*	-0.0115 *0.7237*	0.0126 *0.6974*	-0.1017 *0.0017*	1

Table 4
Regressions of Absolute Abnormal Accruals on Wealth Sensitivity

This table presents the coefficients from regressions of absolute abnormal accruals (|*EM*|) on wealth sensitivity measures and control variables. T statistics appear in italics below the coefficient estimates. Each panel presents regression results for a different model. The models appear at the bottom of the second and third pages of this table. Variables are defined in Appendix B.

Panel A	**Regression Results - Equation (4)**		
	Predicted Sign	CEOs	CFOs
Total Sensitivity	+	0.1976***	-0.0233
		3.03	*-0.34*
TS^2	-	-0.0142**	0.0034
		-2.48	*0.24*
Bonus	+	0.0922*	-0.0260
		1.65	*-0.79*
Size	-	-0.1946***	-0.1154***
		-6.65	*-2.90*
Return on assets	?	0.1099***	0.0720**
		3.59	*1.86*
Market to book	?	0.0949***	0.0751**
		3.73	*2.24*
Debt to assets	+	0.0692**	0.0376
		2.45	*1.06*
Stock volatility	+	0.0582**	0.0758**
		2.42	*2.40*
Adjusted R square		0.0682	0.0382
Panel B	**Regression Results - Equation (5)**		
	Predicted Sign	CEOs	CFOs
Total Sensitivity	+	0.2182**	-0.0221
		3.35	*-0.34*
TS*G	-	-0.0000	-0.0043
		-0.63	*-0.17*
TS^2	-	-0.0137*	0.0038
		-1.51	*0.27*
Governance	-	-0.0389**	-0.0473**
		-1.79	*-1.76*
Bonus	+	0.0863*	-0.0237
		1.52	*-0.72*
Size	-	-0.1746***	-0.1862***
		-5.70	*-2.88*
Return on assets	?	0.0927***	0.0664**
		3.36	*1.70*
Market to book	?	0.0897***	0.0826**
		3.56	*2.16*
Debt to assets	+	0.0828***	0.0471*
		2.89	*1.31*
Stock volatility	+	0.0545**	0.0691**
		2.25	*2.17*
Adjusted R square		0.0732	0.0445

*,**,*** denote significance at p=0.10, 0.05, 0.01, respectively under a one tailed t test

N=1661 for CEOs; N=1249 for CFOs

Table 4, continued 1

Panel C	**Regression Results - Equation (6)**		
	Predicted Sign	CEOs	CFOs
Stock Sensitivity	+	0.2378*** *3.76*	-0.0529 *-1.05*
SS*G	-	0.0024 *0.47*	-0.0138 *-0.49*
SS^2	-	-0.0213*** *-3.10*	0.0155 *1.18*
Option Sensitivity	+	-0.0002 *-0.01*	-0.0002 *-0.15*
OS*G	-	-0.0116 *-0.48*	0.0138 *0.53*
OS^2	-	0.0054 *1.06*	0.0009 *0.42*
Governance	-	-0.0353** *-1.61*	-0.0499* *-1.40*
Bonus	+	-0.0394* *-1.47*	-0.0252 *-0.77*
Size	-	-0.1725*** *-5.45*	-0.1594** *-2.62*
Return on assets	?	0.0968*** *3.32*	0.0661** *1.69*
Market to book	?	0.1026*** *3.82*	0.0749** *2.24*
Debt to assets	+	0.0826*** *2.88*	0.0506* *1.40*
Stock Volatility	+	0.0530** *2.38*	0.0662** *2.07*
Adjusted R square		0.0831	0.0462

*,**,*** denote significance at p=0.10, 0.05, 0.01, respectively under a one tailed t test
N=1661 for CEOs; N=1249 for CFOs

Equation (4) $$EM_{it+1} = \alpha_0 + \alpha_1 Total\ Sensitivity_{it} + \alpha_2 TS_{it}^2 + \alpha_3 Bonus_{it} + \alpha_4 Size_{it} + \alpha_5 ROA_{it} + \alpha_{6_{it}} MTB_{it} + \alpha_7 DTA_{it} + \alpha_8 Stock\ Volatility + \varepsilon_{t+1}$$

Equation (5) $$EM_{it+1} = \alpha_0 + \alpha_1 Total\ Sensitivity_{it} + \alpha_2 TS_{it} * G_{it} + \alpha_3 TS_{it}^2 + \alpha_4 Governance\ Score_{it} + \alpha_5 Bonus_{it} + \alpha_6 Size + \alpha_7 ROA_{it} + \alpha_8 MTB_{it} + \alpha_9 DTA_{it} + \alpha_{10} Stock\ Volatility + \varepsilon_{t+1}$$

Equation (6) $$EM_{it+1} = \alpha_0 + \alpha_1 Stock\ Sensitivity_{it} + \alpha_2 SS_{it} * G_{it} + \alpha_3 SS_{it}^2 + \alpha_4 Option\ Sensitivity_{it} + \alpha_5 OS_{it} * G_{it} + \alpha_6 OS_{it}^2 + \alpha_7 Governance\ Score_{it} + \alpha_8 Bonus_{it} + \alpha_9 Size_{it} + \alpha_{10} ROA_{it} + \alpha_{11} MTB_{it} + \alpha_{12} DTA_{it} + \alpha_{13} Stock\ Volatility + \varepsilon_{t+1}$$

Table 4, continued 2

Panel D	Regression Results - Equation (7)		
	Predicted Sign	CEOs	CFOs
Stock Sensitivity	+	0.2325***	-0.0503
		3.63	*-0.98*
SS*G	-	0.0286	-0.0142
		0.16	*-0.79*
SS^2	-	-0.0240***	0.0186
		-4.12	*1.07*
Vested Sensitivity	+	-0.0620	-0.1256
		-0.92	*-1.20*
VS*G	-	0.0213	-0.0226
		0.65	*-0.37*
VS^2	-	0.0145	-0.0091
		1.20	*-0.79*
Unvested Sensitivity	+	0.0415	0.0541
		0.83	*1.22*
US*G	-	-0.0051	0.0822*
		-0.21	*1.38*
US^2	-	0.0010	-0.0013
		0.11	*-0.71*
Governance	-	-0.0344**	-0.0726**
		-1.73	*-1.98*
Bonus	+	-0.0380*	-0.034
		-1.42	*-0.88*
Size	-	-0.1759***	0.1683***
		-5.55	*3.02*
Return on assets	?	0.0927***	0.0933**
		3.16	*1.88*
Market to book	?	0.0954***	0.0804**
		4.04	*1.96*
Debt to assets	+	0.0830***	0.0480
		2.90	*0.82*
Stock Volatility	+	0.0513**	0.0672**
		2.11	*2.32*
Adjusted R square		0.0825	0.0533

*,**,*** denote significance at p=0.10, 0.05, 0.01, respectively under a one tailed t test

N=1661 for CEOs; N=1249 for CFOs

Equation (7)

$$EM_{it+1} = \alpha_0 + \alpha_1 Stock\ Sensitivity_{it} + \alpha_2 SS_{it} * G_{it} + \alpha_3 SS_{it}^2 + \alpha_4 Vested\ Sensitivity_{it} + \alpha_5 VS_{it} * G_{it} + \alpha_6 VS_{it}^2 + \alpha_7 Unvested\ Sensitivity_{it} + \alpha_8 US_{it} * G_{it} + \alpha_9 US_{it}^2 + \alpha_{10} Governance\ Score_{it} + \alpha_{11} Bonus_{it} + \alpha_{12} Size_{it} + \alpha_{13} ROA_{it} + \alpha_{14} MTB_{it} + \alpha_{15} DTA_{it} + \alpha_{16} Stock\ Volatility + \varepsilon_{t+1}$$

Table 5
Regressions of Signed Abnormal Accruals on Wealth Sensitivity

This table presents the coefficients from regressions of positive (EM+) and negative (EM-) abnormal accruals on wealth sensitivity measures and control variables. T statistics appear in italics below the coefficient estimates. Each panel presents regression results for a different model. The models appear at the bottom of the second and third pages of this table. Variables are defined in Appendix B.

Panel A			**Regression Results - Equation (4)**			
	Predicted Sign		CEOs		CFOs	
Dependent Variavle:	*EM+*	*EM-*	*EM+*	*EM-*	*EM+*	*EM-*
Total Sensitivity	+	-	0.1697*** *2.33*	-0.2037*** *-2.59*	0.0314 *0.34*	0.0925 *0.99*
TS^2	-	+	-0.0135** *-1.94*	0.0095 *1.02*	-0.0103 *-0.62*	-0.0227* *-1.42*
Bonus	+	-	0.0167 *0.44*	0.1173*** *3.14*	0.0501 *0.98*	0.0746* *1.54*
Size	-	+	-0.2599*** *-6.05*	0.1500*** *3.73*	-0.1795*** *-2.73*	0.1335*** *2.45*
Return on assets	?	?	0.1899*** *4.12*	-0.0830** *-2.13*	0.1256** *1.84*	-0.0134 *-0.26*
Market to book	?	?	0.1109*** *3.28*	-0.0889** *-2.32*	0.0759** *1.69*	-0.1183** *-2.03*
Debt to assets	+	?	0.0592* *1.34*	-0.0813** *-2.07*	0.0595 *0.98*	-0.0111 *-0.23*
Stock volatility	+	-	0.0478* *1.37*	-0.0718** *-2.09*	0.0505 *1.10*	-0.0671* *-1.38*
Adjusted R square			0.0751	0.0613	0.0321	0.0450
Panel B			**Regression Results - Equation (5)**			
	Predicted Sign		CEOs		CFOs	
Dependent Variavle:	*EM+*	*EM-*	*EM+*	*EM-*	*EM+*	*EM-*
Total Sensitivity	+	-	0.1626** *2.23*	-0.1979*** *-2.51*	0.0319 *0.34*	0.0984 *1.03*
TS*G	-	+	-0.0301 *-0.58*	-0.0907 *-0.87*	0.0019 *0.09*	-0.0081 *-0.14*
TS^2	-	+	-0.0128** *-1.85*	0.0089 *0.96*	-0.0106 *-0.60*	-0.0242* *-1.51*
Governance	-	+	-0.0469** *-1.98*	-0.0084 *-0.26*	-0.0080 *-0.26*	0.0612* *1.60*
Bonus	+	-	0.0186 *0.49*	0.1191*** *3.18*	0.0508 *0.99*	0.0719* *1.48*
Size	-	+	-0.2586*** *-6.02*	0.1494*** *3.70*	-0.1789*** *-2.71*	0.1327*** *2.42*
Return on assets	?	?	0.1865*** *4.04*	-0.0815** *-2.08*	0.1267** *1.84*	-0.0042 *-0.08*
Market to book	?	?	0.1107*** *3.28*	-0.0890** *-2.32*	0.0756** *1.68*	-0.1207** *-2.07*
Debt to assets	+	?	0.0578* *1.30*	-0.0816** *-2.07*	0.0611 *1.00*	-0.0073 *-0.15*
Stock volatility	+	-	0.0428 *1.23*	-0.0705** *-2.05*	0.0513 *1.11*	-0.0681* *-1.38*
Adjusted R square			0.0796	0.0622	0.0323	0.0511

Table 5, continued 1

Panel C	**Regression Results - Equation (6)**					
	Predicted Sign		CEOs		CFOs	
			Dependent Variable			
	EM+	*EM-*	*EM+*	*EM-*	*EM+*	*EM-*
Stock Sensitivity	+	-	0.2019*** *2.73*	-0.2564*** *-3.10*	-0.0453 *-0.49*	0.0029 *0.03*
SS*G	-	+	-0.0303 *-0.65*	-0.0499 *-0.65*	-0.0377* *-1.56*	0.0007 *0.21*
SS^2	-	+	0.0202*** *-2.67*	0.0157* *1.62*	0.0320* *1.34*	0.0094 *0.38*
Option Sensitivity	+	-	0.0364 *0.66*	0.0712 *0.89*	-0.0372 *-0.38*	-0.0367 *-0.39*
OS*G	-	+	-0.0337 *-1.02*	-0.0239 *-0.80*	0.0262 *0.75*	-0.0001 *0.00*
OS^2	-	+	0.0058 *0.94*	-0.0053 *-0.19*	-0.0019 *-0.11*	-0.0045 *-0.31*
Governance	-	+	-0.0454** *-1.91*	0.0053 *0.17*	0.0001 *0.00*	0.0602* *1.49*
Bonus	+	-	0.0342 *0.89*	0.1239*** *3.31*	0.0411 *0.79*	0.0732* *1.50*
Size	-	+	-0.2700*** *-5.95*	0.1166*** *2.70*	-0.1632*** *-2.45*	0.1562*** *2.86*
Return on assets	?	?	0.1780*** *3.86*	-0.0791** *-2.01*	0.1322** *1.92*	-0.0056 *-0.11*
Market to book	?	?	0.1087*** *3.21*	-0.0953*** *-2.49*	0.0810** *1.80*	-0.1126** *2.06*
Debt to assets	+	?	0.0613* *1.39*	-0.0901** *-2.27*	0.0733 *1.19*	-0.0009 *-0.02*
Stock Volatility	+	-	0.0397 *1.14*	-0.0784** *-2.27*	0.0556 *1.20*	-0.0569 *-1.14*
Adjusted R square			0.0878	0.0681	0.0418	0.0504

*,**,*** denote significance at p=0.10, 0.05, 0.01, respectively under a one tailed t test
N=851 for EM+, 810 for EM- for CEOs; N=607 for EM+, 642 for EM- for CFOs

Equation (4) $$EM_{it+1} = \alpha_0 + \alpha_1 Total\ Sensitivity_{it} + \alpha_2 TS_{it}^2 + \alpha_3 Bonus_{it} + \alpha_4 Size_{it} + \alpha_5 ROA_{it} + \alpha_{6it} MTB_{it} + \alpha_7 DTA_{it} + \alpha_8 Stock\ Volatility + \varepsilon_{t+1}$$

Equation (5) $$EM_{it+1} = \alpha_0 + \alpha_1 Total\ Sensitivity_{it} + \alpha_2 TS_{it} * G_{it} + \alpha_3 TS_{it}^2 + \alpha_4 Governance\ Score_{it} + \alpha_5 Bonus_{it} + \alpha_6 Size + \alpha_7 ROA_{it} + \alpha_8 MTB_{it} + \alpha_9 DTA_{it} + \alpha_{10} Stock\ Volatility + \varepsilon_{t+1}$$

Equation (6) $$EM_{it+1} = \alpha_0 + \alpha_1 Stock\ Sensitivity_{it} + \alpha_2 SS_{it} * G_{it} + \alpha_3 SS_{it}^2 + \alpha_4 Option\ Sensitivity_{it} + \alpha_5 OS_{it} * G_{it} + \alpha_6 OS_{it}^2 + \alpha_7 Governance\ Score_{it} + \alpha_8 Bonus_{it} + \alpha_9 Size_{it} + \alpha_{10} ROA_{it} + \alpha_{11} MTB_{it} + \alpha_{12} DTA_{it} + \alpha_{13} Stock\ Volatility + \varepsilon_{t+1}$$

Table 5, continued 2

Panel D	**Regression Results - Equation (7)**					
	Predicted Sign		CEOs		CFOs	
			Dependent Variable			
	EM+	*EM-*	*EM+*	*EM-*	*EM+*	*EM-*
Stock Sensitivity	+	-	0.2204*** *2.91*	-0.2536*** *-3.05*	-0.0500 *-0.54*	0.0005 *0.01*
SS*G	-	+	-0.0292 *-0.63*	-0.0510 *-0.66*	-0.0176 *-0.67*	0.0003 *0.12*
SS^2	-	+	-0.0244*** *-2.95*	0.0155* *1.59*	0.0327* *1.38*	0.0097 *0.38*
Vested Sensitivity	+	-	-0.0519 *-0.76*	0.0699 *0.85*	-0.1019 *-1.16*	0.0282 *0.28*
VS*G	-	+	0.0205 *0.48*	-0.0228 *-0.53*	-0.0610 *-1.07*	-0.0226 *-0.31*
VS^2	-	+	0.0195** *1.70*	-0.0077 *-0.32*	0.0035 *0.29*	-0.0087 *-0.37*
Unvested Sensitivity	+	-	0.1192** *1.78*	0.0456 *0.55*	0.1073 *1.12*	-0.0594 *-0.64*
US*G	-	+	-0.0373** *-1.68*	-0.0033 *-0.10*	0.1132** *2.07*	0.0325 *0.37*
US^2	-	+	-0.0163* *-1.38*	-0.0092 *-0.39*	-0.0131 *-0.72*	-0.0011 *-0.07*
Governance	-	+	-0.0438** *-1.83*	0.0056 *0.18*	-0.0172 *-0.46*	0.0586* *1.47*
Bonus	+	-	0.0318 *0.83*	0.1221*** *3.24*	0.0369 *0.71*	0.0714* *1.46*
Size	-	+	-0.2741*** *-6.01*	0.1124*** *2.59*	-0.1747*** *-2.60*	0.1586*** *2.85*
Return on assets	?	?	0.1699*** *3.67*	-0.0780** *-1.95*	0.1147** *1.66*	-0.0002 *0.00*
Market to book	?	?	0.1079*** *3.19*	-0.0934** *-2.42*	0.0823** *1.83*	-0.1138** *-1.93*
Debt to assets	+	?	0.0634* *1.43*	-0.0916** *-2.30*	0.0605 *0.98*	-0.0018 *-0.04*
Stock Volatility	+	-	0.0349 *1.00*	-0.0774** *-2.24*	0.0480 *1.04*	-0.0526 *-1.05*
Adjusted R square			0.0931	0.0687	0.0538	0.0531

*,**,*** denote significance at p=0.10, 0.05, 0.01, respectively under a one tailed t test
N=851 for EM+, 810 for EM- for CEOs; N=607 for EM+, 642 for EM- for CFOs

Equation (7)

$$EM_{it+1} = \alpha_0 + \alpha_1 Stock\ Sensitivity_{it} + \alpha_2 SS_{it} * G_{it} + \alpha_3 SS_{it}^2 + \alpha_4 Vested\ Sensitivity_{it} + \alpha_5 VS_{it} * G_{it} + \alpha_6 VS_{it}^2 + \alpha_7 Unvested\ Sensitivity_{it} + \alpha_8 US_{it} * G_{it} + \alpha_9 US_{it}^2 + \alpha_{10} Governance\ Score_{it} + \alpha_{11} Bonus_{it} + \alpha_{12} Size_{it} + \alpha_{13} ROA_{it} + \alpha_{14} MTB_{it} + \alpha_{15} DTA_{it} + \alpha_{16} Stock\ Volatility + \varepsilon_{t+1}$$

Table 6
Tests of Income Smoothing

This table presents the results of the tests of income smoothing. All variables are standardized by industry prior to selecting the observations with the largest abnormal accrual magnitudes. The tests of smoothing presented in this table are conducted on the one-third of the sample with the greatest industry-standardized abnormal accrual magnitudes. Panel A shows the mean positive and negative abnormal accruals, and earnings surprise by wealth sensitivity rank. Earnings surprise is the standardized absolute value of the difference between reported and expected earnings where earnings expectations are based on a random walk with drift. Panel B provides the coefficients for regressions of earnings surprise on sensitivity. Panel C provides the mean coefficients of variation for firm-specific 5 year time series regressions of net income on time for firms whose CEOs wealth sensitivity falls in the upper (high sensitivity), middle (moderate sensitivity) and lower (low sensitivity) one-third of the sample distribution. The coefficient of variation is calculated for each firm as the root mean square error for the time series regression, divided by the mean earnings surprise times one hundred.

Panel A Abnormal Accruals & Earnings Surprise by Sensitivity			
	Positive Abnormal Accruals	Negative Abnormal Accruals	Earnings Surprise
	Total Wealth Sensitivity		
Rank 1 (Low)	0.09	-1.13	0.35
Rank 2 (Mid)	1.06	-1.05	0.19
Rank 3 (High)	1.32	-1.20	-0.11
Rank 3 - Rank 1	1.23**	-0.07	-0.46***
	Stock-based Wealth Sensitivity		
Rank 1 (Low)	0.62	-1.06	0.36
Rank 2 (Mid)	1.01	-1.05	0.14
Rank 3 (High)	1.40	-1.29	-0.06
Rank 3 - Rank 1	0.78**	-0.23*	-0.42***
	Option-based Wealth Sensitivity		
Rank 1 (Low)	1.10	-1.35	0.20
Rank 2 (Mid)	1.07	-1.19	0.21
Rank 3 (High)	0.99	-0.85	-0.07
Rank 3 - Rank 1	-0.11	0.50**	-0.27

*,**,*** denote significance at p=0.10, 0.05, 0.01 respectively under a one-tailed t test

Table 6, continued

Panel B	**Univariate Regressions**	
$Earnings\ Surprise_{it} = \alpha_0 + \alpha_1 Sensitivity_{it} + \varepsilon_{it}$		
	Sensitivity Coefficient	t Statistic
Independent Variable		
Total Wealth Sensitivity	-0.006**	-2.03
Stock-based Wealth Sensitivity	-0.006**	-2.01
Option-based Wealth Sensitivity	-0.004	-0.72

Panel C	**Coefficients of Variation for Regressions of Income on Time**			
	Low Sensitivity	Moderate Sensitivity	High Sensitivity	High minus Low
Total Wealth Sensitivity	6.03	2.73	1.65	-4.38
Stock-based Wealth Sensitivity	6.68	2.39	1.36	-5.32*
Option-based Wealth Sensitivity	1.16	7.38	1.77	0.61

*,**,*** denote significance at p=0.10, 0.05, 0.01, respectively under a one-tailed t test

Table 7
Descriptive Statistics for Insider Transactions

This table provides descriptive statistics for the transaction activities for the sample CEOs and CFOs. Panel A summarizes the distribution of transaction sizes conditioned on the related transaction being reported (i.e. zero values are not included). Scaled shares underlying option grants is the proportion of shares underlying the grant to the sum of shares and options owned prior to the grant. The scaled shares sold, scaled net proceeds, and scaled shares sold are ratios of the shares transacted to the shares owned prior to the transaction. Panel B provides the frequency statistics for CEOs and CFOs by transaction type.

Panel A	**Transaction Characteristics**				
	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
CEOs					
Shares underlying option grants	118,833	145,965	17,911	60,000	152,000
Scaled shares underlying option grants	0.55	3.15	0.04	0.16	0.37
Shares purchased	31,629	65,210	580	4,943	22,590
Scaled shares purchased	0.05	0.24	0.00	0.00	0.00
Shares sold	54,107	83,984	2,996	15,100	62,000
Scaled shares sold	0.19	0.27	0.01	0.07	0.24
Net proceeds from sales (thousands)	$1,493	$2,008	$161	$585	$1,906
Scaled net proceeds from sales	1,644.92	6,060.91	0.03	0.13	0.50
CFOs					
Shares underlying option grants	37,180	42,475	7,500	20,000	50,000
Scaled shares underlying option grants	0.40	1.31	0.07	0.22	0.42
Shares purchased	5,819	10,933	265	1,029	5,000
Scaled shares purchased	0.16	0.56	0.00	0.00	0.00
Shares sold	17,512	23,428	2,177	8,000	21,500
Scaled shares sold	0.44	0.39	0.07	0.30	0.92
Net proceeds from sales (thousands)	$1,229	$1,499	$203	$729	$1,735
Scaled net proceeds from sales	1,674.88	5,358.85	0.07	0.33	4.79

Panel B	**Frequency of Transactions**	
	Number of Transactions in Executive-Quarters	
	CEOs	CFOs
Option grants	1887	1203
Stock purchases	495	341
Stock sales	1869	910
No transactions*	3095	2583
Total executive quarters	6250	4324
	Number of Individuals with Transactions	
	CEOs	CFOs
Option grants	376	256
Stock purchases	168	110
Stock sales	361	254
No transactions**	22	33
Total executives	380	264

*Includes quarters 1 through 6 following a stock sale where no other transactions are reported

**Number of individuals reporting no transactions over the entire study period

Table 8
Abnormal Accruals by Transaction Type

This table provides a summary of the distribution of abnormal accruals by transaction type. The transactions included represent those for which no other transactions are reported in the quarter of the transaction, and for which no stock sales have occurred within the prior six quarters. The control mean is the mean value of abnormal accruals for the executive-quarters where no transactions are reported.

			Abnormal Accruals						
	Number of Executive-Quarters	Number of Firms Re-presented	Percent Positive	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile	Transaction Mean Minus Control Mean
CEOs	4085	329							
No transactions	2171	292	53.2%	0.0016*	0.0536	-0.0255	0.0021	0.0256	
Option grants	515	188	51.8%	-0.0001	0.0485	-0.0223	0.0021	0.0261	-0.0016
Stock purchases	174	96	47.1%$^{+}$	-0.0054*	0.0490	-0.0340	-0.0019	0.0251	-0.0070**
Stock sales	301	231	52.5%	0.002	0.0496	-0.0216	0.0030	0.0307	0.0005
Sales quarter +1	248	183	55.6%	0.0102***	0.0513	-0.0191	0.0064	0.0401	0.0086***
Sales quarter +2	164	117	56.1%	0.0072**	0.0532	-0.0214	0.0058	0.0370	0.0056*
Sales quarter +3	168	117	59.5%$^{++}$	0.0085***	0.0469	-0.0159	0.0075	0.0304	0.0069**
Sales quarter +4	129	105	57.4%	0.0050	0.0520	-0.0151	0.0056	0.0315	0.0034
Sales quarter +5	115	105	54.8%	0.0056*	0.0450	-0.0146	0.0045	0.0253	0.0040
Sales quarter +6	100	87	50.0%	0.0027	0.0523	-0.0176	0.0004	0.0256	0.0012
CFOs	3399	243							
No transactions	2001	230	53.1%	0.0013	0.0540	-0.0264	0.0030	0.0305	
Option grants	468	195	48.5%$^{++}$	-0.0020	0.0506	-0.0287	-0.0007	0.0271	-0.0033
Stock purchases	139	77	61.9%$^{++}$	0.0091***	0.0480	-0.0184	0.0010	0.0337	0.0079**
Stock sales	209	169	47.8%$^{+}$	0.0029	0.0498	-0.0242	-0.0024	0.0322	0.0016
Sales quarter +1	170	130	43.5%$^{+++}$	0.0006	0.0509	-0.0270	-0.0045	0.0263	-0.0006
Sales quarter +2	117	96	58.1%	0.0099**	0.0494	-0.0196	0.0097	0.0309	0.0086**
Sales quarter +3	102	78	58.8%	0.0105***	0.0453	-0.0179	0.0066	0.0294	0.0093**
Sales quarter +4	64	58	56.3%	0.0102**	0.0379	-0.0074	0.0105	0.0311	0.0089**
Sales quarter +5	72	67	62.5%$^{+}$	0.0069*	0.0409	-0.0079	0.0106	0.0260	0.0057
Sales quarter +6	57	53	59.6%$^{+}$	0.0104**	0.0359	-0.0080	0.0047	0.0265	0.0091*

*,**,*** denote significance at p=0.10, 0.05, 0.01 respectively under a one-tailed t test

$^{+,++,+++}$ denote significance at p=0.10, 0.05, 0.01, respectively under a binomial probability distribution with probability of a positive value equal to 0.532 for CEOs, and 0.531 for CFOs

Table 9
Mean Abnormal Accruals by Transaction Size

Mean abnormal accruals for CEOs and CFOs are calculated separately by transaction size. Size of sales and purchases (grants) are measured as the proportion of shares sold or purchased to shares (shares+options) owned prior to the transaction, standardized for each executive type by industry. Small, medium and large sales are those that fall within the lowest, middle and highest thirds of the sample distribution, respectively, for each executive type. Only those transaction-quarters for which no transactions other than the one of interest are reported and for which no stock sales have occurred within the prior six quarters are included.

	CEOs					CFOs				
		Transaction Size					Transaction Size			
	N per Group	Small	Medium	Large	Large Mean Minus Control Mean	N per Group	Small	Medium	Large	Large Mean Minus Control Mean
Option Grants	172	0.0015 (0.44)	-0.0015 (-0.36)	-0.0001 (-0.03)	-0.0017 (0.39)	156	-0.0071* (-1.58)	-0.0046 (-1.11)	0.0001 (0.02)	-0.0011 (-0.2)
Stock Purchases	58	-0.0014 (-0.24)	-0.0092* (-1.31)	-0.0101* (-1.57)	-0.0117* (-1.43)	46	0.0047 (0.63)	0.0009 (0.11)	0.0128** (1.80)	0.0116* (1.60)
Stock Sale	100	-0.0003 (-0.17)	-0.0005 (-0.33)	0.0043** (2.26)	0.0027* (1.53)	70	0.0019 (0.76)	-0.0017 (-0.67)	0.0015 (0.54)	0.0002 (0.17)
Sales quarter+1	83	0.0007 (0.39)	0.0011 (0.66)	0.0076*** (3.91)	0.0060*** (2.72)	57	0.0007 (0.26)	0.0012 (0.47)	0.0006 (0.21)	-0.0007 (0.21)
Sales quarter+2	55	0.0005 (0.29)	0.0011 (0.67)	0.0058*** (2.92)	0.0042* (1.28)	39	0.0011 (.38)	0.0000 (0.03)	0.0021 (0.79)	0.0009 (1.02)
Sales quarter+3	56	0.0010 (0.52)	0.0018 (1.07)	0.0074*** (3.59)	0.0058* (1.46)	34	0.0022 (0.76)	-0.0015 (-0.50)	0.0050** (1.79)	0.0038** (1.66)
Sales quarter+4	43	0.0001 (0.05)	0.0021* (1.28)	0.0081** (2.03)	0.0065 (0.29)	21	0.0019 (0.58)	-0.0010 (-0.34)	0.0047** (1.73)	0.0035 (0.38)
Sales quarter+5	38	-0.0014 (-0.65)	0.0045*** (2.64)	0.0092*** (4.18)	0.0076* (1.29)	24	0.0051* (1.64)	-0.0014 (-0.46)	0.0065** (2.28)	0.0053 (0.83)
Sales quarter+6	33	-0.0015 (-0.69)	0.0019 (1.08)	0.0110*** (4.88)	0.0094*** (2.32)	19	0.0078*** (2.38)	-0.0021 (-0.64)	0.0078*** (2.74)	0.0066* (1.28)

Table 10
Regressions of Abnormal Accruals on Insider Transactions

This table presents the coefficients from regressions of abnormal accruals on insider transactions and control variables. Grant, purchase and the sale variables are indicator variables that equal one if the transaction is in the upper one-third of the size distribution for the transaction-executive combination. T statistics appear in italics below the coefficient estimates. The two regression models appear at the bottom of the second page of the table. Variables are defined in Appendix B.

		Equation (9)		Equation (10)	
	Predicted Sign	CEO	CFO	CEO	CFO
Intercept		0.0007 *0.91*	0.0012* *1.38*	0.0008 *1.09*	0.0010 *1.16*
Grant	–	-0.0016 *-0.71*	-0.0046** *-1.51*	-0.0021 *-0.90*	-0.0046** *-1.71*
Grant * G	+			0.0020 *1.07*	-0.0005 *-0.20*
Purchase	–	-0.0070*** *-2.87*	-0.0014 *-0.47*	-0.0069*** *-2.82*	-0.0012 *-0.40*
Purchase * G				0.0013 *0.59*	0.0009 *0.61*
Sale	+	-0.0034* *-1.51*	-0.0014 *-0.44*	-0.0027* *-1.42*	-0.0016 *-0.51*
Sale * G	–			-0.0014 *-0.80*	0.0020 *0.84*
Sale+1	+	0.0038* *1.52*	-0.0028 *-0.83*	0.0042** *1.65*	-0.0032 *-0.97*
Sale+1 * G	–			-0.0014 *-0.79*	0.0009 *0.63*
Sale+2	+	0.0015 *0.59*	-0.0005 *-0.14*	0.0014 *0.52*	-0.0011 *-0.29*
Sale+2 * G	–			0.0001 *0.07*	0.0024 *1.20*
Sale+3	+	0.0017 *0.65*	0.0025 *0.70*	0.0019 *0.72*	0.0021 *0.57*
Sale+3 * G	–			-0.0015 *-0.81*	0.0011 *0.61*
Sale+4	+	0.0033* *1.28*	0.0002 *0.06*	0.0032* *1.36*	-0.0003 *-0.06*
Sale+4 * G	–			0.0012 *0.59*	0.0008 *1.09*
Sale+5	+	0.0038* *1.33*	0.0052* *1.29*	0.0036* *1.37*	0.0046 *1.15*
Sale+5 * G	–			0.0011 *0.53*	0.0021 *0.73*
Sale+6	+	0.0054** *1.80*	0.0034 *0.77*	0.0055** *1.82*	0.0027 *0.61*

Table 10, continued

		Equation (9)		Equation (10)	
	Predicted Sign	CEO	CFO	CEO	CFO
Sale+6 * G	–			-0.0015 *-0.69*	-0.0001 *-0.02*
Governance score	–			0.0068 *0.90*	0.0164 *1.24*
Sale * Buy	?	0.0006 *0.81*	0.0125* *1.33*	-0.0005 *-0.76*	-0.0011 *-0.20*
Sale+1 * Buy	?	-0.0025 *-0.74*	-0.0018 *-0.31*	0.0026 *0.75*	-0.0018 *-0.17*
Sale+2 * Buy	?	0.0012 *0.78*	-0.0004 *-0.33*	0.0010 *0.31*	-0.0010 *-0.70*
Sale+3 * Buy	?	0.0002 *0.28*	-0.0011 *-0.77*	-0.0001 *-0.01*	0.0013 *0.12*
Sale+4 * Buy	?	0.0001 *0.01*	0.0003 *0.02*	0.0006 *0.79*	-0.0003 *-0.44*
Sale+5 * Buy	?	0.0065 *0.80*	-0.0065 *-0.50*	0.0020 *0.24*	0.0046 *1.26*
Sale+6 * Buy	?	0.0022 *0.26*	0.00154* *1.33*	-0.0021*** *-3.02*	-0.0022*** *-4.36*
Size	–	-0.0009* *-1.48*	-0.0001 *-0.18*	-0.0008 *-1.05*	0.0011** *1.92*
Return on assets	–	-0.0022*** *-3.62*	-0.0006 *-0.73*	-0.0023*** *-3.78*	-0.0007** *-1.67*
Market to book	?	-0.0033*** *-5.67*	-0.0045*** *-5.98*	-0.0030*** *-4.88*	-0.0041*** *-5.37*
Debt to assets	+	-0.0003 *-0.46*	-0.0004 *-0.54*	-0.0003 *-0.49*	-0.0004 *-0.58*
Stock volatility	?	-0.0008* *-1.41*	-0.0022*** *-2.91*	-0.0012** *-1.73*	-0.0025*** *-3.22*
Adjust R square		0.0108	0.0114	0.0134	0.0168

*,**,***denote significance at p=0.10, 0.05, 0.01, respectively
N=6250 for CEOs, N=4324 for CFOs

Equation (9) $$EM_{it+1} = \alpha_0 + \alpha_1 Grant_{it} + \alpha_2 Purchase_{it} + \alpha_3 Sale_{it} + \sum_{j=1}^{6} \alpha_{j+3} Sale_{it-j} + \sum_{j=1}^{6} \alpha_{j+9} Sale_{it-j} * Buy_{it} + \alpha_{16} Size_{it} + \alpha_{17} ROA_{it} + \alpha_{18} MTB_{it} + \alpha_{19} DTA_{it} + \alpha_{20} StockVolatility_{it} + \varepsilon_{it}$$

Equation (10) $$EM_{it+1} = \alpha_0 + \alpha_1 Grant_{it} + \alpha_2 Grant_{it} * G_{it} + \alpha_3 Purchase_{it} + \alpha_4 Purchase_{it} * G_{it} + \alpha_5 Sale_{it} + \alpha_6 Sale_{it} * G_{it} + \sum_{j=1}^{6} \alpha_{j+6} Sale_{it-j} + \sum_{j=1}^{6} \alpha_{j+12} Sale_{it-j} * G_{it} + \alpha_{19} Governance\ Score_{it} + \sum_{j=1}^{6} \alpha_{j+19} Sale_{it-j} * Buy_{it} + \alpha_{26} Size_{it} + \alpha_{27} ROA_{it} + \alpha_{28} MTB_{it} + \alpha_{29} DTA_{it} + \alpha_{30} StockVolatility_{it} + \varepsilon_{it}$$

Appendix A

Black Scholes Option Valuation

Option values are calculated for each option grant using the Black Scholes (1973) option pricing formula as modified by Merton (1973) for dividend payments.

$$V = \left[Se^{-dT} N(Z) - Xe^{-rt} N(Z - \sigma T^{\frac{1}{2}}) \right]$$

where

V = *option value as of fiscal year-end*

S = *price of stock as of fiscal year-end*

N = *cumulative distribution function for the normal distribution*

X = *execise price of option*

d = *natural logarithm of the three year average dividend yield*

T = *time to maturity of option in years*

σ = *return volatility estimated as the annualized standard deviation of the natural logarithm of stock returns for the last 120 trading days of the fiscal year*

r = *risk - free interest rate calculated as the natural logarithm of the 3 month treasury constant maturities as of fiscal year-end*

and $Z = \left[\ln(S / X) + T(r - d + \sigma^2 / 2) \right] / \sigma T^{\frac{1}{2}}$

Appendix B

Variable Definitions

Salary	=	Annual salary as reported by Execucomp
Bonus	=	Annual bonus (Execucomp) scaled by the sum of salary and bonus
Stock	=	Shares of unrestricted stock owned by CEO
Restricted stock	=	Shares of restricted stock held by CEO
Options	=	Shares of stock underlying options held
Grants	=	Shares of stock underlying annual option grants
Exercises	=	Shares of stock underlying options exercised during the year
Total sensitivity	=	Change in value of stock and option holdings given a 1% change in year-end stock price scaled by the sum of salary and bonus
TS*G	=	Interaction term between total sensitivity and governance score (defined below)
TS^2	=	Total sensitivity squared
Stock-based wealth sensitivity	=	Change in value of stock holdings given a 1% change in year-end stock price scaled by the sum of salary and bonus
S*G	=	Interaction term between stock-based wealth sensitivity and governance score (defined below)
S^2	=	Stock-based wealth sensitivity squared
Option-based wealth sensitivity	=	Change in Black-Scholes value of option holdings given a 1% change in year-end stock price scaled by the sum of salary and bonus
O*G	=	Interaction term between option-based wealth sensitivity and governance score (defined below)
O^2	=	Option-based wealth sensitivity squared
Vested options	=	Options that are vested as of fiscal year-end plus options that vest during the next fiscal year
Vested sensitivity	=	Change in Black-Scholes value of vested options given a 1% change in year-end stock price scaled by the sum of salary and bonus
V*G	=	Interaction term between vested sensitivity and governance score (defined below)
V^2	=	Vested sensitivity squared
Unvested options	=	Options that are unvested and will remain unvested for next fiscal year
Unvested sensitivity	=	Change in Black-Scholes value of unvested options given a 1% change in year-end stock price scaled by the sum of salary and bonus
U*G	=	Interaction term between unvested sensitivity and governance score (defined below)
U^2	=	Unvested sensitivity squared
Salary	=	Annual salary as reported by Execucomp
Bonus	=	Annual bonus (Execucomp) scaled by the sum of salary and bonus

Appendix B, continued 1

Outside	=	Fraction of the total board of directors comprised of directors with no (non-director) affiliation with firm
Directors	=	Total number of directors on the board
Meetings	=	Number of meetings held by board of directors during the year
Institutional holdings	=	Fraction of firm's shares of common stock held by institutional investors with holdings reportable on form 13f
G score	=	Composite measure of shareholder protection from Gompers et al. (2003)
Governance score	=	Composite measure of governance strength based on outside, directors, meetings, institutional holdings and G score, constructed using principal component analysis
Total assets	=	Total assets at fiscal year-end (Compustat data item 6)
Sales	=	Total sales for fiscal year (Compustat data item 12)
Market value of equity	=	Total common shares outstanding at fiscal year-end (Compustat data item 25) times price per share at fiscal year-end (Compustat data item 24)
Size	=	Natural logarithm of market value of equity
Market to book (MTB)	=	Market value of equity divided by book value of equity (Compustat data item 60)
Return on assets (ROA)	=	Net income (Compustat data item 172) divided by total assets (Compustat data item 6)
Debt to assets (DTA)	=	Total liabilities (Compustat data item 181) divided by total assets
Abnormal accruals (EM)	=	Abnormal accruals estimated using a cross-sectional modified Jones model scaled by beginning of the year total assets
Positive abnormal accruals (EM+)	=	Abnormal accruals with value greater than or equal to zero
Negative abnormal accruals (EM –)	=	Abnormal accruals with value less than zero
Earnings surprise	=	The difference between actual and expected earnings scaled by expected earnings where expected earnings are based on a random walk with drift
Net income	=	Net income before extraordinary items and discontinued operations (Compustat data item 18)
Grant	=	Indicator variable equal to 1 if a large option grant occurred in the period
Grant*G	=	Interaction term between grant and governance score
Purchase	=	Indicator variable equal to 1 if a large stock purchase occurred in the period
Purchase*G	=	Interaction term between purchase and governance score
Sale	=	Indicator variable equal to 1 if a large stock purchase occurred in the period

Appendix B, continued 2

Sale*G	=	Interaction term between sale and governance score
Sale+1 ($Sale_{t-1}$)	=	Indicator variable equal to 1 if a large stock sale occurred in the prior period
Sale+1 * G	=	Interaction term between sale+1 and governance score
Sale+2 ($Sale_{t-2}$)	=	Indicator variable equal to 1 if a large stock sale occurred two periods prior
Sale+2 * G	=	Interaction term between sale+2 and governance score
Sale+3 ($Sale_{t-3}$)	=	Indicator variable equal to 1 if a large stock sale occurred three periods prior
Sale+3 * G	=	Interaction term between sale+3 and governance score
Sale+4 ($Sale_{t-4}$)	=	Indicator variable equal to 1 if a large stock sale occurred four periods prior
Sale+4* G	=	Interaction term between sale+4 and governance score
Sale+5 ($Sale_{t-5}$)	=	Indicator variable equal to 1 if a large stock sale occurred five periods prior
Sale+5 * G	=	Interaction term between sale+5 and governance score
Sale+6 ($Sale_{t-6}$)	=	Indicator variable equal to 1 if a large stock sale occurred six periods prior
Sale+6 * G	=	Interaction term between sale+6 and governance score
Buy	=	Indicator variable equal to 1 if a large purchase or large grant occurred in the period
Sale*Buy	=	Interaction term between sale and buy; term is equal to one if both sale and buy occurred in the period
Sale+1*Buy	=	Interaction term between sale and buy; term is equal to one if a sale occurred in the prior period and buy occurred in the current period
Sale+2*Buy	=	Interaction term between sale and buy; term is equal to one if a sale occurred two periods prior and buy occurred in the current period
Sale+3*Buy	=	Interaction term between sale and buy; term is equal to one if a sale occurred three periods prior and buy occurred in the current period
Sale+4*Buy	=	Interaction term between sale and buy; term is equal to one if a sale occurred four periods prior and buy occurred in the current period
Sale+5*Buy	=	Interaction term between sale and buy; term is equal to one if a sale occurred five periods prior and buy occurred in the current period
Sale+6*Buy	=	Interaction term between sale and buy; term is equal to one if a sale occurred six periods prior and buy occurred in the current period

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